



REPORT

OF

**THE RAILWAY ACCIDENTS
INQUIRY COMMITTEE 1968**

PART I

NOVEMBER, 1968



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CHAPTER I

INTRODUCTORY

In the latter half of March 1968, two unfortunate railway accidents—one at Yalvigi on the Southern Railway on 19-3-1968 and the second at Bharwari on the Northern Railway on 30-3-1968—involving heavy casualties and damage to railway property took place in quick succession. The close sequence in which they followed each other greatly agitated the public mind. Immediately after the Yalvigi accident, the Press and Parliament had shown considerable concern and in response to it, a Commission of Inquiry presided over by a Judge of a High Court had been appointed under the Commission of Inquiry Act (1952) to determine the cause of the accident. The view was also expressed in Parliament that some radical measures were required to ensure a reasonable measure of safety in rail travel. It was against this background that on 1-4-1968, while making a statement on the accident at Bharwari in Parliament, the Minister for Railways, Shri C. M. Poonacha, announced the setting up of a Committee under the Chairmanship of Shri K. N. Wanchoo, retired Chief Justice of India, to go into the question of railway accidents. Two days later, through their Notification No. ERB-I/68COI/46 dated 3-4-1968, the Government of India made the following announcement :—

“Following the two Railway accidents at Yalvigi and Bharwari on the 19th and 30th March, 1968, the Minister for Railways announced in Parliament that a High Power Committee would be appointed to look into the causes leading to accidents on the Indian Railways, with particular reference to the implementation of the recommendations of the Railway Accidents Committee of 1962, headed by Shri H. N. Kunzru.

2. The Government of India have accordingly decided to constitute a Committee, to be known as the Railway Accidents Inquiry Committee 1968, consisting of the following :—

- (1) Shri K. N. Wanchoo, retired Chief Justice of India—*Chairman*.
- (2) Shri M. R. Masani, Member of Parliament—*Member*.
- (3) Shri S. R. Vasavada, President of National Federation of Indian Railwaymen—*Member*.
- (4) Shri F. C. Badhwar, retired Chairman, Railway Board—*Member*.
- (5) Shri P. B. Aibara, Commissioner of Railway Safety—*Member*.

3. The terms of reference of the Committee will be :—

- (i) To review the position of accidents on the Indian Railways since the appointment of Railway Accidents Committee—1962, in the light of recommendations made by it and the implementation thereof.

(ii) To suggest measures for further minimising the accidents.

1. The Committee will endeavour to complete their work as early as possible.

Sd/- C. S. PARAMESWARAN
Secretary, Railway Board."

2. On 11-4-1968, Shri K. D. Madan, an officer of the Operating Department of the Northern Railway, was appointed to function as the Secretary of the Committee. The necessary provision of ministerial and other staff for the Committee was made shortly thereafter.

3. *Line of approach:*—The Railway Accidents Inquiry Committee (1968) (hereinafter referred to as the Committee) held their first meeting on 29-4-1968 to chalk out their line of approach. It was decided that for the purpose of review of the position of accidents as required in item (i) of the Committee's terms of reference, a period of 5 years commencing from 1st April 1963 and ending on 31st March 1968 be taken. This, the Committee considered, would not only facilitate discernment of any patterns or trends in the incidence of railway accidents but would also show whether as a result of the impact of the implementation of the recommendations made by the Railway Accidents Committee, 1962 (hereinafter referred to as the Kunzru Committee), the curve or curves reflecting the incidence of accidents had been deflected in any way. It was also decided that notwithstanding the broader definition given by the Railway administration to the term 'railway accident' which includes a wide variety of occurrences including failures of engines, rolling stock, permanent way etc., not necessarily resulting in mishaps, the Committee, for the purpose of their study would confine their analysis mainly to the four principal categories of accidents, namely, collisions, derailments (including those caused by train wrecking), fires in trains and accidents at level crossings. Some other categories of accidents like averted collisions, breach of block rules and drivers passing signals at danger which though accidents only in a technical sense carry potential hazard would also be studied.

4. Since the terms of reference laid down in the Notification required of the Committee, in particular, to review the position of accidents in the light of recommendations made by the Kunzru Committee and their implementation, the Committee were also called upon to examine closely the action taken on the recommendations made by the Kunzru Committee so as to be able to render an appreciation of the implementation of these recommendations.

5. With this end in view, as a first step, statistical and analytical data on accidents in various categories and information on other cognate matters were called for from the Railway Administrations. For this purpose, about 70 proformae were prescribed by the Committee. Simultaneously, questionnaires were addressed to the Railway Administrations, the Commissioner and the Additional Commissioners of Railway Safety and the Research, Designs and Standards Organisation for furnishing information on specific issues. Communications were also addressed to the two organised bodies of railwaymen's trade unions, namely, the National Federation of Indian Railwaymen and the All-India Railwaymen's Federation, to the two

associate bodies of chambers of commerce and industry, namely, the Associated Chambers of Commerce and Industry, Calcutta, and the Federation of Indian Chambers of Commerce and Industry, New Delhi, to the Zonal Railway Users' Consultative Committees (which have among others, passengers' interests represented on them) requesting them to give to the Committee the benefit of any observations which they may like to make having a bearing on the terms of reference of the Committee. A public notice was also published in about 30 newspapers—both English and regional languages—having a wide circulation and given countrywide publicity requesting the general public to come forward and send their observations or suggestions on matters connected with the terms of reference of the Committee. The public notice evoked a good response and a large number of letters were received reflecting wide-spread public concern in the matter of railway safety. In addition, a detailed appreciation was called for from the Railway Board of the action taken on each of the recommendations contained in the Kunzru Committee's Report. On the information furnished by the Railway Board in this behalf, further elucidation was sought and obtained.

6. *Decision to submit Part I of the Report*—The Committee, after due deliberation, considered that the two terms of reference set down for them were distinct from each other in character. The first of these terms, broadly speaking, required (a) a statistical appreciation of the trend of accidents since the setting up of the Kunzru Committee and (b) an appreciation of the action taken by the Government on the Kunzru Committee's recommendations and the Committee's evaluation in regard to these. The second term of reference which is broader in character required of the Committee to suggest further ways and means for minimising the accidents. The Committee decided that the first term of reference may be covered in Part I of their Report.

7. The second part of the Committee's Report would be devoted to suggestions to minimise accidents further. These suggestions would be crystallised in the light of discussions with senior railway officers—working and retired—visits to railway installations during the course of the tours of the Committee and their talks with railwaymen of different categories and with outsiders, and in the light of other ideas which may be thrown up in the course of their deliberations. It is possible that the Committee may find it necessary to amplify, in the second part of their Report, some of the observations made here, in the light of further information and elucidation.

CHAPTER II

STATISTICAL APPRECIATION OF IMPORTANT CATEGORIES OF TRAIN ACCIDENTS

8. The survey of train accidents which follows is, as stated in paragraph 3 of Chapter I, restricted mainly to four categories of accidents, namely, collisions, derailments, accidents at level crossings and fires in trains. It is these categories which ordinarily result in loss of life or damage to property, and by and large the rail user judges the record of safety of railway travel by the incidence of such accidents. Apparently, it is on this consideration that the Kunzru Committee had referred to these categories of accidents as 'important' accidents. It is in view of this that in the paragraphs which follow the analysis is mainly confined to these categories. In addition, other categories which are accidents only technically but are otherwise potential hazards like averted collisions, breach of block rules, drivers disregarding signals have been surveyed in broad terms towards the end of this chapter.

9. In the course of Part I of their Report, the Kunzru Committee had covered a period of five years from 1957-58 to 1961-62 and in Part II, had projected their survey to the year 1962-63 for certain categories of accidents. In order, therefore, to bring out a comparative perspective, this Committee have, wherever possible, juxtaposed the corresponding figures for the years 1957-58 to 1962-63 in their study.

10. The following table indicates the year-to-year incidence in each of the four categories of accidents from the year 1957-58 onwards till the year 1967-68:—

TABLE I
Incidence of important train accidents

Year	Colli- sions	Derail- ments	Accidents to trains at level crossings	Fires in trains	Total
1	2	3	4	5	6
1957-58	125	1164	138	302	1729
1958-59	108	1389	151	367	2015
1959-60	111	1456	127	303	1997
1960-61	129	1412	182	402	2125
1961-62	123	1433	161	235	1952
1962-63	103	1338	168	242	1851
Total for six years	699	8192	927	1851	11669
Yearly average	116.5	1365.3	154.5	308.5	1944.8
1963-64	86	1277	164	115	1642
1964-65	86	1028	133	32	1279
1965-66	79	951	128	42	1200
1966-67	68	865	104	53	1090
1967-68	70	879	114	42	1105
Total for five years	389	5000	643	284	6316
Yearly average	77.8	1000	128.6	56.8	1263.2

11. It will be seen that in each of the four categories of accidents, there was a significant decrease during the 5 years ending 1967-68 as compared to the 6-year period ending 1962-63. The decline over these years was fairly steady except for the year 1967-68 when there was a slight reversal of the trend.

12. The position which emerges by relating the annual total of such accidents gaugewise to the volume of traffic (reckoned in terms of million train kilometres) is shown in the following table:—

TABLE 2

Incidence of accidents gaugewise in relation to density factor in terms of million train kilometres

Year					Broad Gauge			Index
					Number of accidents	(Million) train kilometres	Accidents per million train kms.	
1957-58	..	..	..	..	989		4.0	
1958-59	..	..	..	..	950		3.9	
1959-60	..	..	..	..	962		3.8	
1960-61	..	..	..	..	1058		4.1	
1961-62	..	..	..	..	914		3.4	
1962-63	..	..	..	..	907		3.3	100
1963-64	..	..	..	..	827	270.0	3.1	94
1964-65	..	..	..	..	589	276.9	2.1	64
1965-66	..	..	..	..	535	287.4	1.9	58
1966-67	..	..	..	..	484	291.3	1.7	52
1967-68	..	..	..	..	503	295.1	1.7	52

Year					Metro Gauge			Index
					Number of accidents	(Million) train kilometres	Accidents per million train Kms.	
1957-58	..	..	..	..	640		5.4	
1958-59	..	..	..	..	939		7.8	
1959-60	..	..	..	..	881		7.1	
1960-61	..	..	..	..	896		7.0	
1961-62	..	..	..	..	893		6.8	
1962-63	..	..	..	..	858		6.5	100
1963-64	..	..	..	..	732	133.09	5.5	85
1964-65	..	..	..	..	610	137.36	4.4	68
1965-66	..	..	..	..	598	140.43	4.3	66
1966-67	..	..	..	..	533	140.88	3.8	58
1967-68	..	..	..	..	528	139.97	3.8	58

TABLE 2—*contd.*

Year	Narrow Gauge			
	Number of accidents	(Million) train kilometres	Accidents per million train kms.	Index
1957-58	..	..	..	..
1958-59	..	..	..	..
1959-60	..	..	..	..
1960-61	..	..	..	..
1961-62	..	..	..	..
1962-63	..	..	..	..
	*130		11.4	*100
1963-64	..	..	..	..
1964-65	..	..	..	..
1965-66	..	..	..	..
1966-67	..	..	..	..
1967-68	..	..	..	..
	83	11.41	7.3	63
	80	11.37	7.0	61
	67	11.31	6.0	53
	73	11.54	6.3	55
	74	11.66	6.3	55

*This figure represents the average number of important accidents on the narrow gauge system of the Indian Government Railways during the years 1957-58 to 1962-63, based on the information contained in the Kunzru Committee's Report.

13. It will be seen that the number of accidents as well as the derivative obtained by relating the incidence to traffic density expressed in terms of million train kilometres declined uniformly during the years 1963-64 to 1967-68 in comparison with the previous six years over all the gauges. Taking 1962-63 as the base year, the index came down by somewhat less than half, ranging from 52 to 58 over the different gauges.

14. The overall picture being as indicated above, we now pass on to individual categories of accidents.

Collisions

15. Collisions carry the highest hazard in respect both of casualties and damage. This is highlighted by the figures in the following table:—

TABLE 3

	Total number	Casualties			Loss in Rupees
		Number of per- sons killed	No. of persons injured	Total number	
Important train accidents	..	6316	623	3662	4,92,68,738
Collisions	..	389	255	1955	1,50,53,510
Percentage	..	6.2	40.9	53.4	51.5
Percentage for six yrs. 1957-58 to 1962-63 (as recorded by Kunzru Committee)					
	6	—	—	42	27

16. It will be seen that the collisions while constituting only 6 per cent of the total number of important accidents accounted for no less than 41 per cent of the deaths, 53 per cent of the injuries and 31 per cent of the loss arising from damage as well as ex-gratia payments and compensation claims. It may be stated that even during the years 1957-58 to 1962-63, the Kunzru Committee had found that the collisions while constituting only 6 per cent of the total number of the important categories of train accidents accounted for 42 per cent of casualties and 27 per cent of damage.

17. The number of train collisions on the Indian Government Railways during the years 1957-58 to 1967-68 is given in the following table:—

TABLE 4
Number of collisions per million train kilometres

Year					Number of train collisions	Incidence of train collisions per million train kilometres
1957-58	..	..	..	..	125	0.34
1958-59	..	..	..	..	108	0.29
1959-60	..	..	..	..	111	0.29
1960-61	..	..	..	..	129	0.33
1961-62	..	..	..	..	123	0.31
1962-63	..	..	..	..	103	0.25
Total for 6 years	..	..	..	..	699	0.31
1963-64	..	..	..	..	86	0.20
1964-65	..	..	..	..	86	0.20
1965-66	..	..	..	..	79	0.18
1966-67	..	..	..	..	68	0.15
1967-68	..	..	..	..	70	0.16
Total for 5 years	..	..	..	..	389	0.18

18. It will be seen that there was a perceptible decline in the number of collisions during the years 1963-64 to 1967-68 in comparison with the preceding six years. Even if for the sake of parity, only a period of 5 years, namely, 1958-59 to 1962-63 were to be taken of the previous period reviewed by the Kunzru Committee, the number of train collisions during these years was 574 in comparison with which the figure of 389 collisions in the last 5 years registered a significant improvement. No doubt, the position during the last two years 1966-67 and 1967-68 remained more or less unchanged. The incidence in relation to the traffic density reckoned in terms of million train kilometres also showed a perceptible decrease, having come down from 0.31 for the six years ending 1962-63 to 0.18 during the subsequent five years signifying a fall of about 42 per cent.

19. At this stage, it is also necessary to observe that the analysis of train accidents in the subsequent paragraphs (except where otherwise indicated) is confined to the incidence on the broad and the metre gauges. The analysis relating to accidents on the narrow gauge portion of the Indian Government Railways is attempted separately towards the end of this chapter. This course was adopted as the narrow gauge sections of the Indian Government Railways constitute a very small proportion. The number of accidents on the narrow gauge in the context of the overall figures is small and incorporating these along with accidents on other gauges in gauge-wise analysis would have, on the one hand, cluttered up the tables and on the other made comparisons difficult on account of factors which are characteristic of narrow gauge alone.

20. Having made these initial observations on train collisions, we revert to the analysis of train collisions on the broad gauge and the metre gauge. During the six years 1957-58 to 1962-63, 688 train collisions occurred on the broad and the metre gauge sections. As against this, during the five years 1963-64 to 1967-68, the number of train collisions on the broad and the metre gauges was 380. The position of collisions on the various Railways is shown in Annexure I. It will be seen that the number of collisions came down noticeably on all the Railways individually. If, for parity, the performance for an equal number of years were to be compared, it is observed that during the years 1958-59 to 1962-63, the total number of collisions was 563 as against which 380 collisions in the last five years signify a distinct improvement. Moreover, the incidence of collisions expressed in terms of the rate per million train kilometres also showed an appreciable improvement during the five years 1963-64 to 1967-68 when compared with the performance of the preceding years. The overall improvement in the rate per million train kilometres has been of the order of about 41 per cent.

21. If the figures were to be rearranged separately for the broad and the metre gauges, the position would be as shown in Annexure II. The figures show at a glance a decrease of about 49 per cent in the incidence of collisions per million train kilometres on the broad gauge and about 30 per cent on the metre gauge during the years 1963-64 to 1967-68 as compared to the years 1957-58 to 1962-63. It would also be noted that the wide gap in the incidence of collisions per million train kilometres between the two gauges which the Kunzru Committee had brought out in their Report narrowed down considerably during the last five years even though the incidence on the metre gauge continued to be lower than on the broad gauge. The narrowing down of the gap in the incidence on the two gauges was thus primarily because of the improvement on the broad gauge. Here we feel constrained to remark that we are unable to see why the incidence of collisions related to traffic density factor should be more on broad gauge than on metre gauge. The Kunzru Committee had apparently accepted the position that the higher incidence of collisions on the broad gauge than on the metre gauge was inevitable inasmuch as they had prescribed different long-term targets for the two gauges. Even the Railway Board took this phenomenon for granted and in their directives to the Railway administrations issued from time to time, laid down separate targets for the two gauges. We see no reason for fixing targets in this behalf and are unable to subscribe to the view that higher incidence of collisions on the broad gauge is inevitable. The fact that the disparity in the incidence on the two gauges has narrowed down considerably during the last few years lends support to our view.

22. Restating these figures Railway-wise and separately for the broad and the metre gauges the position is as shown in Annexure III. The relevant figures would show that the incidence on the broad gauge both in terms of the number of accidents as also in relation to the traffic density factor has decreased significantly on almost all the Railways. The very wide variation in the performance of the various Railways shows no clear pattern from which any useful conclusion can be drawn.

23. At this stage, it is relevant to study the incidence of collisions separately for passenger and goods trains and to relate it to passenger and goods train kilometres respectively during the last five years ending 1967-68. The position which emerges is shown in the following table:—

TABLE 5

Year	Passenger trains						Goods trains			
	Broad gauge				Metre gauge		Broad gauge		Metre gauge	
	No.		Incidence		No.		No.		Incidence	
			per million pass. train kms.						per million goods train kms.	
1963-64	..	14	0.11		10	0.13	44	0.35	15	0.30
1964-65	..	13	0.10		13	0.17	41	0.33	16	0.31
1965-66	..	27	0.19		9	0.11	31	0.24	12	0.23
1966-67	..	18	0.12		2	0.02	33	0.25	14	0.27
1967-68	..	23	0.16		12	0.15	25	0.18	8	0.16
Total	..	95	0.14		46	0.12	174	0.27	65	0.25

24. The incidence in relation to the density factor in respect of goods trains, it would be seen, has been around double that of passenger trains. It would also be seen that while in relation to per million goods train kilometres the incidence of goods train collisions has been showing a more or less downward trend, the position in regard to passenger train collisions in this behalf has been fluctuating. In fact, both on the broad gauge and the metre gauge the incidence as also the index in relation to million train kilometres showed an increase in 1967-68 in so far as passenger trains are concerned—a none too happy feature.

25. In Annexures IV and V, collisions have been classified into certain well-recognised types for the purpose of analysis. These show the comparative position of each group of collisions during the five years from 1963-64 to 1967-68 in comparison with the preceding six years. The group of collisions, namely, between 'a train and shunting engine etc.', which had been treated as one type by the Kunzru Committee was for the purpose of our review split up into two separate groups, namely, 'between a train and a shunting engine or vehicles during shunting' and 'between a train and rake or load or vehicles stabled on running line' because of their distinct characteristics.

26. Taking the broad gauge first, the relative position of the various groups is shown in Annexure IV. It will be seen that the largest proportion of collisions during the period 1963-64 to 1967-68 was between two trains or between trains and light engines. These collisions constituted 50.6 per cent of the total number of collisions on the broad gauge. It is noteworthy that during the years 1957-58 to 1962-63 the percentage of such collisions was only 28.7 per cent of the total number of collisions even while the collisions between two light engines were then included under this head. These have since been excluded. The incidence of such collisions shot up in 1962-63 and though since then, some decline has been registered, the incidence has continued to be high.

27. As stated above, the group which in Annexure IV has been classified as collisions 'between a train and a shunting engine etc.' during the years 1957-58 to 1962-63 has for the purpose of subsequent years been split up under two heads. This, therefore, has to be kept in view while comparing the period of 6 years from 1957-58 to 1962-63 with the subsequent five years from this angle. Bearing this in mind, it would be seen that in this group, a distinct improvement was registered during the five years ending 1967-68 when comparing it with the period surveyed by the Kunzru Committee. Notwithstanding this improvement, the percentage of collisions 'between a train and a rake or load or vehicles stabled on a running line' during the years 1963-64 to 1967-68 was substantial, namely, 12.6 per cent. This would appear to be a pointer to the fact that lever collars and similar reminder appliances on which the Kunzru Committee laid much stress do not seem to be in regular use and this habit needs to be ingrained into the station staff.

28. The incidence of collisions between a train and a trolley or lorry, happily, registered a substantial decrease in the years 1963-64 to 1967-68 when compared with the earlier six years. It is, however, noticed that as between one year and another, there were wide fluctuations in the incidence and whereas only 3 such accidents occurred in 1963-64, no less than 10 occurred in 1967-68. Considering that in most such collisions the responsibility rests squarely on the official-in-charge of the trolley or lorry who is usually a responsible railway official, and also that usually such accidents are caused by misjudgment of speed or distance of the train by the official-in-charge of the trolley and his aides, there is clearly considerable scope to reduce and, if possible, to eliminate such accidents.

29. In the group of collisions 'between a train and buffer ends or other stationary objects' too, the number decreased from 20 in the 6 years ending 1962-63 to 11 in the subsequent five years. Here too, the trend over the 11 years has been a fluctuating one and in particular during the first four years of the five reviewed by the present Committee, the incidence registered a rise from 1 to 6.

30. On the metre gauge, the break-up of collisions under similar types was as shown in Annexure V. It would be seen from the Annexure that there has been a decline in the number of collisions under each group except those between a train and buffer ends or other stationary objects when comparing the five years 1963-64 to 1967-68 with the previous six years ending 1962-63. Here also, the collisions under the group 'between a train and

shunting engine etc.' during the preceding six years have, for the purpose of comparison, to be considered against two separate groups taken together, namely, 'between a train and a shunting engine or vehicles during shunting' and 'between a train and a rake or load or vehicles stabled on a running line'. It would be seen that there has been improvement under this head. Unlike on the broad gauge, the number as well as the percentage of collisions between a train and a rake or load or vehicles stabled on a running line exceeds those between a train and a shunting engine or vehicles during shunting during the period under review. Observations made in the concluding portion of para 27 would thus apply equally here too.

31. Rendered separately for passenger and goods trains, the yearly incidence and percentage of the different classes of collisions during the years 1963-64 to 1967-68 is given in Annexure VI for the two gauges together. It will be seen that during the years 1963-64 to 1967-68, 141 passenger trains and 239 goods trains constituting 37 per cent and 63 per cent respectively of the total number of cases were involved in collisions. The position in 1967-68, however, was that more passenger trains were involved in collisions than goods trains, the respective number being 35 against 33.

32. Studied Railway-wise, the incidence and percentage of different classes of collisions on the broad and metre gauge systems taken separately for each of the Railways for the years 1963-64 to 1967-68 are given in Annexure VII.

33. We now turn to the principal causes for train collisions during the years 1963-64 to 1967-68. In the following table, the number of collisions due to various broad causes for each of the years 1957-58 to 1962-63 on the one hand and of 1963-64 to 1967-68 on the other, is shown.

TABLE 6

Causewise analysis of collisions—Yearly and according to causes

Year	Reception of a train on a blocked line or despatching it into a blocked section		Drivers disregarding signals or failing to control trains		Trolleys or Lorries not being protected.		Miscellaneous	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1957-58	44	11	14	6	13	4	25	8
1958-59	23	17	10	6	18	1	24	8
1959-60	33	11	10	2	17	9	18	9
1960-61	32	8	31	3	30	4	15	5
1961-62	21	16	22	8	28	10	11	4
1962-63	21	9	20	1	14	2	21	8
Total	174	72	107	29	120	30	114	42
1963-64	42	14	11	7	2	2	3	2
1964-65	28	16	17	5	7	7	2	1
1965-66	32	14	15	7	8	..	3	..
1966-67	23	9	20	4	5	1	3	2
1967-68	19	10	23	6	6	3	..	1
Total	144	63	86	29	28	13	11	6

34. It will be seen that during 1963-64 to 1967-68, 144 collisions on the broad gauge and 63 on the metre gauge were caused by reception of trains on a blocked line or despatching the trains into a blocked section or incorrect setting of points. During the previous six years, the corresponding figures due to this cause had been 174 and 72 respectively. The average number of collisions contributed by this cause in the years 1963-64 to 1967-68, taken on the broad gauge and metre gauge together, remained more or less the same as during the preceding six years, the respective annual averages being 41 in each period. As for collisions caused by drivers disregarding signals or failing to control trains, the number of such accidents was 86 on the broad gauge and 29 on the metre gauge during 1963-64 to 1967-68 against the corresponding figures of 107 and 29 respectively during the previous six years. The average number of accidents attributable by this cause during the five years ending 1967-68 too remained more or less the same as during the preceding six years. The averages during the two respective periods were 23 and 22.7 respectively, indicating a marginal increase.

35. These causes taken together, or in other words, the specific failures of station staff and drivers, were responsible for 230 collisions on the broad gauge and 92 on the metre gauge during the years 1963-64 to 1967-68. During the previous six years, such failures contributed 281 on the broad gauge and 101 on the metre gauge.

36. The Railwaywise position showing the contribution of each cause to collisions on broad gauge and metre gauge systems during the last five years is shown in Annexure VIII. The incidence of collisions due to failures of station staff was the heaviest on the Central, the Northern and the South Eastern Railways, due to failures of drivers on the South Eastern and the Eastern Railways and due to non-protection of trolleys or lorries on the Southern Railway.

37. We next analyse the failures of station staff splitting them up according to various specific failures. For the purpose of this analysis, we group these according to whether the collision took place at the time of reception of the train, or while despatching a train or in the block section, collisions which occurred at stations due to vehicles escaping being taken in the third group. The results are shown in the following table:—

TABLE 7
Failures of station staff classified

Causes	B.G.		M.G.		Total	
	No.	%	No.	%	No.	%
1. Reception of a train on a blocked line due to						
(a) line being occupied	49	50.0	22	45.8	71	48.6
(b) incorrect setting of points ..	18	18.3	14	29.2	32	21.9
(c) Signals taken off for a train not put back "ON" ..	3	3.2	1	2.1	4	2.8
(d) fouling mark not clear ..	18	18.3	7	14.6	25	17.1
(e) obstruction of line during shunting ..	10	10.2	4	8.3	14	9.6
		100		100		100
Total* ..	98	68.1	48	76.2	146	70.5

TABLE 7—*contd.*

Causes	B.G.		M.G.		Total	
	No.	%	No.	%	No.	%
2. When despatching a train:						
(a) by sending it into a blocked section ..	6	18·8	2	16·7	8	18·2
(b) fouling mark not clear	6	18·8	1	8·3	7	15·9
(c) obstruction during shunting or bumping against train going away ..	19	59·3	5	41·7	24	54·5
(d) Incorrect setting of points ..	1	3·1	4	33·3	5	11·4
		100		100		100
Total* ..	32	22·2	12	19·0	44	21·3
3. Collisions in block section or at stations due to vehicles escaping ..	14	9·7	3	4·8	17	8·2
Grand Total ..	144		63		207	

*The percentages worked out in the total column are of the total of each group to the 'Grand total'.

38. It will be seen that nearly 71 per cent of the collisions occurred at the time of reception of trains and 21 per cent at the time of despatch of trains. Of the collisions caused by reception of trains on blocked lines, nearly half (49 per cent) were due to lines being occupied, 22 per cent due to incorrect setting of points and 17 per cent due to fouling marks not being cleared. Ten per cent of such accidents were due to obstruction of the line during shunting. As against this, of the collisions which occurred during the course of despatch of trains, nearly 55 per cent occurred due to obstruction of line on account of vehicles in the process of shunting.

39. The failures of drivers in so far as they were responsible for collisions have been analysed under various heads in the table below:—

TABLE 8
Drivers' failures classified

Causes	B.G.		M.G.		Total	
	No.	%	No.	%	No.	%
Collisions caused by drivers:						
(a) disregarding signals or overshooting ..	46	53.5	17	58.6	63	54.8
(b) failing to control trains on account of defective brake power	7	8.2	1	3.5	8	6.9
(c) mismanagement of the engine crew, or running at excessive speed	9	10.4	8	27.6	17	14.8
(d) not observing rules when passing Automatic Signal ..	14	16.3	2	6.8	16	13.9
(e) moving against signals during shunting.	10	11.6	1	3.5	11	9.6
Total ..	86		29		115	

40. It will be seen that more than half of the collisions on both the gauges (nearly 54 per cent on the broad gauge and 59 on the metre gauge) occurred as the drivers disregarded signals or overshoot the signals governing them. In addition, nearly 10 per cent of the collisions were caused due to drivers moving against signals during shunting.

41. A study was also conducted to see if any particular speed range figures in a pronounced manner in the incidence of collisions whether on the broad or the metre gauge and whether in respect of passenger or goods trains. The results of the study are shown in Annexure IX. This Annexure will show that in respect of collisions involving passenger trains, 59 per cent of such collisions on the broad gauge involved trains in the speed range of over 50 and upto 75 kilometres per hour. Another 25 per cent of collisions involving passenger trains on the broad gauge took place on trains with speeds above 75 kilometres per hour. On the metre gauge, 61 per cent of collisions involving passenger trains were of trains with speeds of 50 kilometres per hour or less and the remaining 39 per cent of trains over 50 and upto 75 kilometres per hour. In the case of collisions involving goods trains, 49 per cent of the trains on broad gauge had speeds of 50 kilometres per hour or less and 80 per cent of the trains on the metre gauge had speeds of 40 kilometres per hour or less. On the basis of these observations, it is clear that the factor of speed has no marked correlation with the incidence of collisions within authorised speed ranges.

42. Thus far, in the preceding paragraphs, the survey attempted to bring out the incidence of collisions and the frequency of these causes. In concluding the study on collisions, the categories of staff, who on inquiry, were found responsible for the collisions during the 5 years ending 1967-68 and the respective number of each are shown in the following table. For the purpose of this table, all the staff held responsible for a particular collision have been included. In other words, where more than one individual were found to blame for the collision all have been reckoned.

TABLE 9
Categories of staff held responsible for causing collisions

Categories of staff held responsible	Number
1. SMs, ASMs and CASMs	148
2. Switchmen, Pointsmen, Levermen and Cabinmen	103
3. Shunting Jamadars, Yard Foremen, other Shunting and Yard Staff	78
4. Guards	54
5. Drivers, Motormen and Shunters	212
6. PWIs and APWIs	36
7. Gangmates and Permanent Way Mistries	29
8. Signalling and Interlocking staff	8
9. Carriage and Wagon staff	12
10. Loco Maintenance Staff	3
11. Other staff	65
Total	748

43. The primary responsibility for collisions, as is well known, ordinarily lies on staff in the categories of station masters, assistant station masters or cabin assistant station masters, switchmen, levermen, cabinmen, pointsmen, shunting and yard staff, guards, drivers, motormen and shunters or more generally on the station staff or the loco running staff. It will be seen that 80 per cent of the staff responsible for collisions belonged to these categories.

44. The nature of punishments awarded to staff held responsible for causing collisions during the last five years was also studied. The position is indicated in the table below:—

TABLE 10

Nature of punishment	No. of staff punished
(i) Removal from service	109
(ii) Compulsory retirement	5
(iii) Reduction in rank or grade	201
(iv) Withholding of increments	272
(v) Withholding of promotion	3
(vi) Other punishments like fines, censure, stoppage of privilege of passes or Privilege Ticket Orders or both	23
(vii) Prosecuted and convicted	44
(viii) Punishment not yet finalised	83
Total	740*

*NOTE—A few of the errant staff either lost their lives or could not otherwise be proceeded against.

Derailments

45. Next to collisions, the highest hazard potential in railway accidents is in derailments. Derailments of trains take place either during the run between stations or at stations while being received or despatched or during shunting. Of the important train accidents, they constitute the largest number. This is brought out in the following table relating to the years 1963-64 to 1967-68:—

TABLE 11

Particulars of accidents	Total Number	Casualties			Loss in Rupees
		Killed	Injured	Total	
Important train accidents ..	6316	623	3662	4285	4,92,88,738
Derailments ..	5000	202	1250	1452	2,74,64,216
Percentage ..	79.2	32.4	34.1	33.9	55.7
Percentage for the six years 1957-58 to 1962-63 (As recorded by Kunzru Committee)	70 (app.)			35	71 (damage)

46. It will be seen that during the 5 years ending 1967-68, derailments which constituted about 79 per cent of the total number of important accidents on all the Railways accounted for 34 per cent of the casualties and 56 per cent of loss due to the damage to property, compensation claims, etc., resulting from all important accidents. Here, it may be remarked that during the 6 years ending 1962-63, derailments constituted about 70 per cent of the important accidents and resulted in 35 per cent and 71 per cent respectively of casualties and damage. Considering the magnitude of this category of railway accidents, we think it necessary to make a detailed study of train derailments.

47. The table below gives the incidence of derailments separately for the broad gauge and the metre gauge during the 5 years 1963-64 to 1967-68 as also the preceding 6 years ending 1962-63. Derailments on the narrow gauge have not been included.

TABLE 12

*Number of derailments per million train kilometres
(from 1957-58 to 1967-68)*

Years	Broad Gauge		Metre Gauge	
	Total number of derailments	Derailments per million train kms.	Total number of derailments	Derailments per million train kms.
1957-58	594	2.4	483	4.0
1958-59	560	2.2	736	6.1
1959-60	624	2.4	702	5.6
1960-61	608	2.3	686	5.3
1961-62	610	2.3	707	5.4
1962-63	615	2.2	661	5.0
Average for six years	600	2.3	665	5.2
1963-64	623	2.3	593	4.5
1964-65	452	1.6	505	3.7
1965-66	386	1.3	508	3.6
1966-67	338	1.2	463	3.3
1967-68	368	1.2	449	3.2
Total for five years	2167		2518	
Average for five years	433	1.5	504	3.7

48. A generally declining trend is discernible over the years both on the broad gauge and the metre gauge though on the broad gauge the position remained more or less static since 1965-66. It is, however, reassuring to observe that compared with the earlier six years, i.e., 1957-58 to 1962-63, the rate of derailments per million train kilometres has, during the years 1963-64 to 1967-68, fallen by about 35 per cent on the broad gauge and about 29 per cent on the metre gauge.

49. The incidence of derailments on the metre gauge has continued to be consistently higher than on the broad gauge despite the lesser train kilometrage on the former. While the train kilometres on the broad gauge are more than double that on the metre gauge, the incidence per million train kilometres on the broad gauge has been less than half of that on the metre gauge. This of course as stated in the earlier part of this para has been there all through and was so even during the years 1957-58 to 1962-63.

50. Annexure X shows the derailments on each Railway separately for the broad and the metre gauge portions, indicating the relative position or midsection and station derailments during the 5 years ending 1967-68 in juxtaposition with the 6 years ending 1962-63. While overall, there has been an improvement in the position as far as incidence of derailments is concerned the position relating to mid-section derailments, which by and large are the more serious among train derailments, has not kept pace with the improvement as registered in station derailments. This is borne out by the fact that whereas during the years 1957-58 to 1962-63 the proportion of midsection derailments to the total was 17 per cent on the broad gauge and 36 per cent on the metre gauge, the corresponding percentage during the 5 years 1963-64 to 1967-68 was 27 and 39 respectively. Furthermore, the figures contained in Annexure X indicate that the position in regard to midsection derailments has registered comparative deterioration on the broad gauge. This was contributed by the Northern, the Southern and the South Eastern Railways. On the metre gauge too, there was a sharp rise in midsection derailments on the Northeast Frontier Railway.

51. Hitherto, we had surveyed the overall incidence of derailments over the two gauges. Studying the incidence separately for passenger and goods trains the position is shown in Annexure XI. Incidence per million passenger train kilometres and goods train kilometres in respect of each gauge is shown separately in this Annexure. It will be seen that there was an increase in the number of passenger train derailments on both the gauges and goods train derailments on the broad gauge during 1967-68 as compared to the previous year.

52. Railwaywise, the position over the five years, 1963-64 to 1967-68, is represented in Annexure XII which shows that the Southern and the Northeast Frontier Railways take the top positions both in respect of passenger as well as goods train derailments per million train kilometres on the broad and metre gauges respectively.

53. Annexure XIII shows the incidence separately in respect of passenger and goods train derailments from the point of view of whether they took place at stations or in midsection. This shows that on the broad gauge, the incidence of passenger train station and midsection derailments was the highest on the Northern Railway and of goods train station and

midsection derailments on the Central and the South Eastern Railways. On the metre gauge, the derailments involving both passenger and goods trains at stations were the heaviest on the North Eastern Railway and in midsection on the Northeast Frontier Railway.

54. Having made these observations on the incidence of derailments, we pass on to the chief factors responsible for causing derailments. The following table sets out the position according to the broad causes tabulated in column 1.

TABLE 13

Main causes of derailments at stations and in midsection

Derailments caused by	1957-58 to 1962-63					
	Broad Gauge			Metre gauge		
	At stations	In mid-section	All derailments	At stations	In mid-section	All derailments
1. Staff failures	52.0 (1562)	10.8 (66)	45.1 (1628)	45.9 (1176)	19.0 (269)	36.4 (1445)
2. Permanent way failures ..	11.6 (349)	19.3 (117)	12.9 (466)	13.9 (358)	10.7 (151)	12.8 (509)
3. Carriage and Wagon defects ..	12.6 (378)	33.4 (204)	16.1 (582)	12.3 (315)	32.6 (460)	19.5 (775)
4. Engine defects	3.5 (105)	5.9 (36)	3.9 (141)	4.3 (110)	3.8 (54)	4.1 (164)
5. Miscellaneous causes	20.3 (607)	30.6 (187)	22.0 (794)	23.6 (603)	33.9 (479)	27.2 (1082)
6. Total	3001	610	3611	2562	1413	3975

Derailments caused by	1963-64 to 1967-68					
	Broad gauge			Metre gauge		
	At stations	In mid-section	All derailments	At stations	In mid-section	All derailments
1. Staff failures	51.8 (814)	16.0 (95)	42.0 (909)	43.8 (675)	20.7 (202)	34.8 (877)
2. Permanent way failures ..	14.6 (229)	28.4 (170)	18.4 (399)	13.0 (201)	16.6 (162)	14.4 (363)
3. Carriage and Wagon defects ..	18.4 (289)	30.0 (178)	21.6 (467)	15.8 (245)	32.4 (316)	22.3 (561)
4. Engine defects	4.0 (68)	4.6 (27)	4.0 (90)	11.6 (179)	5.0 (49)	9.1 (228)
5. Miscellaneous causes	11.2 (177)	21.0 (125)	14.0 (302)	15.8 (243)	25.3 (246)	19.4 (489)
6. Total	1572	595	2167	1543	975	2518

NOTE:—The Railwaywise position is given in Annexures XIV to XIX.

55. It will be seen from the above table that except in the case of engine defects on the metre gauge, the incidence of derailments attributable to each of the five groups of causes on both broad gauge and metre gauge declined substantially in the five years ending 1967-68 as compared to the preceding six years. In respect of engine defects, the number of derailments on the metre gauge went up from 164 in the six years ending 1962-63 to 228 in the subsequent five years, the annual average having thus increased from about 27 to about 45, a rise of nearly 66 per cent.

56. *Staff failures*:—As for the relative contribution of each causative factor, we first take 'staff failures'. Staff failures which mainly consist in faulty manipulation of points, improper setting and non-locking of points, drivers' failures, and defective loading accounted for 42 per cent derailments on the broad gauge and about 35 per cent on the metre gauge during the five years ending 1967-68. In comparison, during the six years ending 1962-63, 45 per cent on broad gauge and 36 per cent on metre gauge resulted from such failures. The total number attributable to this cause on the two gauges was 909 and 877 respectively during the last five years as compared to 1628 and 1445 during the preceding six years. Not only did the total number of derailments attributable to staff failures come down during the last five years but even the relative weightage (in percentage) of staff failures as a cause of derailments showed a marginal reduction during the period under review. The midsection derailments attributable to staff failures, taken separately, however, went up on the broad gauge from 66 during the preceding six years to 95 during the last five years. Their percentage too registered a corresponding rise from about 11 to 16. On the metre gauge, even though the total number of midsection derailments attributable to staff failures came down from 269 to 202, the relative percentage of such derailments to the total number of derailments on the metre gauge went up from 19 to nearly 21 in the last five years.

57. *Permanent Way failures*:—Here too, while the total number of derailments attributable to this cause came down substantially during the period under review as compared to the preceding six years, i.e., from 975 to 762, the number of midsection derailments attributable to this cause went up on both the gauges—on the broad gauge from 117 to 170 and on the metre gauge from 151 to 162. Considering that the figures for the earlier period relate to six years, the increase in the midsection derailments on the two gauges during the period under review when compared to the previous six years becomes all the more substantial. This is also reflected in the increase in the percentage of midsection derailments attributable to permanent way failures to the total number of derailments from about 19 to about 28 on the broad gauge and from nearly 11 to nearly 17 on the metre gauge. The derailments at stations, no doubt, came down on both the gauges, but even so the percentage contribution of the permanent way failures in such derailments went up from about 12 on the broad gauge during the period to about 15.

58. *Carriage and wagon defects*:—The number of derailments attributable to carriage and wagon defects—in midsection as well as at stations—showed a decrease on both the broad and the metre gauges during the five years ending 1967-68 as compared with the preceding six years. The relative weightage of carriage and wagon defects as a cause, however, underwent some change during these years. As would be observed from Table 13, 21.6 per cent of the derailments on the broad gauge and 22.3 per cent of the derailments on the metre gauge were due to carriage and wagon

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defects during the last five years. The corresponding figures for 1957-58 to 1962-63 were 16.1 per cent on the broad gauge and 19.5 per cent on the metre gauge. The relative weightage of carriage and wagon defects as a factor in the incidence of derailments was thus more pronounced during the last five years on both the broad gauge and metre gauge systems. As to midsection derailments, the carriage and wagon defects were responsible for 30 per cent and 32.4 per cent of the midsection derailments on the broad gauge and metre gauge respectively during 1963-64 to 1967-68 as against the corresponding figures of 33.4 per cent and 32.6 per cent of the derailments on the two gauges respectively during 1957-58 to 1962-63. The weightage of this factor in midsection derailments thus remained more or less static. On the other hand, in station derailments, the relative contribution of carriage and wagon defects as a factor registered a rise on the broad as well as the metre gauges during the last five years as compared to the period 1957-58 to 1962-63.

59. Since carriage and wagon defects bear an obvious relation to the work performed by rolling stock expressed in terms of million vehicle kilometres, the incidence of derailments on the Railways due to carriage and wagon defects has been correlated to vehicle kilometres in Annexure XX, for the broad gauge and in Annexure XXI for the metre gauge.

60. It will be seen that on the broad gauge, there was an improvement on the Eastern, the Central, the South Eastern and the Western Railways but some deterioration on the Northern and the Southern Railways. On the metre gauge, however, all the Railways showed improvement.

61. *Engine Defects*:—We next turn to engine defects as a causative factor. As already mentioned in para 55 it would be seen from Table 13 that while on the broad gauge, the incidence of derailments attributable to engine defects showed a clear decline in the five years ending 1967-68 as compared with the previous six years, on the metre gauge, the incidence due to this factor went up both in respect of midsection as well as station derailments. This is indeed disquieting.

62. As to the relative weightage of engine defects as a factor in derailments, it is observed that particularly in respect of station derailments, the percentage attributable to engine defects on both the gauges increased during the five years ending 1967-68, being 4 on the broad gauge and 11.6 on the metre gauge as against 3.5 and 4.3 during the preceding six years.

63. Related to the density of traffic, the incidence of derailments attributable to engine defects on the broad and the metre gauges is shown in Annexure XXII and Annexure XXIII respectively.

64. These Annexures will show that while on the broad gauge improvement was registered on all the Railways except the Southern, on the metre gauge, the position deteriorated on all the Railways except the Northern.

65. *Miscellaneous Gauges*:—As will be seen from Table 13 and Annexures XIV to XIX, there was a substantial reduction in the incidence of derailments attributable to 'Miscellaneous causes' during 1963-64 to 1967-68 as compared to 1957-58 to 1962-63 on both the broad gauge and the metre gauge systems. This decrease is noticeable in respect of both station and midsection derailments on all Railways except that the Northeast Frontier Railway has registered an increase from 71 midsection derailments during 1957-58 to 1962-63 to 100 such derailments during 1963-64 to 1967-68 due to miscellaneous causes.

66. In Annexure XXIV the passenger and the goods train derailments have been analysed separately according to each of these broad causes. It will be seen that failures of staff accounted for the largest number of derailments of both passenger and goods trains on the broad gauge and of goods trains on the metre gauge.

67. With a view to having a closer look at each of the broad causes referred to in the foregoing paragraphs, these have been further itemised according to their nature. Taking 'staff failures' first, the primary causes which constitute this broad head have been classified in Annexure XXV. It will be clear from this that a large proportion of derailments on both the gauges was caused by incorrect setting or non-locking or faulty operation of points. Disregard of approach and departure signals and failure to regulate or control trains on the broad gauge, excessive speed and faulty driving on the metre gauge were the other main contributory factors.

68. The Railwaywise position reflecting the weightage of various primary causes under the main head 'staff failures' is given in Annexure XXVI. It will be seen from this that the largest number of derailments due to incorrect setting or non-locking of points and due to drivers' failures occurred on the Central Railway on the broad gauge and on the North Eastern Railway on the metre gauge.

69. The broad cause 'track defects' has been itemised according to the nature of defects found responsible for derailments in Annexure XXVII. It will be seen that a substantial number of derailments on both the gauges was caused by sinkage of track and other causes like defective cross or longitudinal levels, bad alignment, incorrect gauge, etc., which are manifestations of unsatisfactory maintenance of track.

70. Railwaywise position in this regard is given in Annexure XXVIII. The incidence of derailments due to poor maintenance of track has been the heaviest on the Southern and the South Eastern Railways and due to sinkage of track on the South Eastern and the Northeast Frontier Railways.

71. By way of comparison, the position in respect of derailments caused by sinkage of track on the one hand and by defective track material and other track defects on the other on some of the Railways during the years, 1963-64 to 1967-68 in juxtaposition with the preceding six years as brought out by the Kunzru Committee is shown in Annexure XXIX. It will be seen that the position on the Southern and the South Eastern Railways worsened as far as sinkage of track was concerned.

72. The broad cause 'carriage and wagon defects' has also been classified under various primary causes according to their particular nature in Annexure XXX. It will be seen from this that defective or broken springs or suspensions, broken axles or journals, defective wheels and tyres, and breakage of undergear, vacuum or brake fittings were the chief carriage and wagon defects responsible for derailments on both the gauges.

73. The corresponding position of such carriage and wagon defects according to Railways is given in Annexure XXXI. The incidence of derailments due to defective or broken springs or suspensions was the highest on the South Eastern and the Southern Railways, due to broken axles

and journals on the Northern and the Western Railways and due to breakage of undergear and brake fittings on the South Eastern and the North Eastern Railways.

74. Engine defects as a causative factor in derailments are itemised under primary causes in Annexure XXXII. The largest single primary factor in derailments due to engine defects on the broad gauge as seen from this annexure was defective wheels and tyres. On the metre gauge too, apart from "other engine defects" this was the largest single factor.

75. The position in regard to the primary factors responsible for derailments under the main cause "engine defects" Railway-wise is given in Annexure XXXIII. It will be seen that the incidence of derailments due to defective wheels and tyres was the highest on the Southern Railway on the broad gauge and the Western Railway on the metre gauge.

76. Annexure XXXIV gives a break-up of the causes which go to form the broad cause referred to as 'miscellaneous causes' Railwaywise position is given in Annexure XXXV. The largest number of derailments due to 'miscellaneous causes' was attributable to obstruction of track. Derailments due to 'cause not determined' and 'other causes' accounted for nearly 39 per cent and 42 per cent respectively on the two gauges.

77. It may be pertinent to observe that during the course of our investigations, while going into certain other cognate matters, we noticed that in respect of a large number of cases of derailments, the Railway administration were, for the purpose of their own analysis showing the cause as "accidental". On enquiry, we were advised by the Railway Board that cases where responsibility could not be fixed were being classified as 'accidental'. We apprehend that by treating the causes of derailments wholesale as 'accidental' in a substantial number of cases, the administration's attention is unlikely to be pin-pointed on the source of trouble. Furthermore, the plethora of cases shown under this head would appear to indicate as if the enquiring officers were bringing a departmental approach to bear on the question and avoiding the fixing of pointed responsibility.

78. The analysis in the preceding paragraphs was from the point of view of causes that lead to derailments. In Annexure XXXVI, the results of a study bringing out the factor of the speed range of trains involved in derailments are shown. It will be recalled that a similar study in respect of collisions was attempted in Annexure IX and para 41.

79. On the broad gauge, the largest number of passenger trains involved in derailments had a speed of over 50 kms. p.h. and upto 75 kms. p.h. It will be recalled that in collisions too, it is this speed range which featured most. In case of goods trains, the largest number involved trains having a speed range of 50 kms.p.h. or less.

80. On the metre gauge, the largest number of passenger trains involved in derailments had a speed of 50 kms. p.h. or less and the largest number of goods trains involved in derailments had speeds of 40 kms.p.h. or less.

81. It would thus appear that within these ranges, the speed factor does not have a direct correlation with the incidents of derailments.

82. As in the case of collisions, the categories of staff found responsible for causing derailments during the 5 years ending 1967-68 have been enumerated in the table below. In the figures of the number of staff held responsible, all staff found to blame in a case of derailment have been included. In other words, where more than one person was found to blame in a single case of derailment all have been included.

TABLE 14

Categories of staff	Number of staff held responsible
1. Station Masters, Assistant Station Masters	322
2. Pointsmen, Levermen and Cabinmen	695
3. Shunting Jamadars and other shunting staff	69
4. Yard Foremen and other yard staff	31
5. Guards	534
6. Commercial staff	138
7. Drivers	1186
8. Shunters	33
9. P.W. Is and A.P.W. Is	334
10. Gangmates, Permanent Way Mistries and Keymen	612
11. Signalling and Interlocking staff	39
12. Carriage and wagon staff	861
13. Loco maintenance staff	219
14. Other staff	69
15. Total	5142

83. It will be seen that the staff mainly held responsible are in the categories of drivers, carriage and wagon staff, pointsmen, levermen and cabinmen, gangmates, permanent way mistries and keymen and guards. The drivers constituted the highest number held responsible for causing derailments and accounted for nearly one-fourth. The carriage and wagon staff were the next highest in number followed by staff in the category of pointsmen, levermen and cabinmen together.

84. A study was also conducted to see the nature of punishments imposed on the staff held responsible for causing derailments. The results are shown in the table below:

TABLE 15

Nature of punishment	Number of staff
(i) Removal from service	175
(ii) Compulsory retirement	15
(iii) Reduction to lower time scale of pay, grade, post or service	511
(iv) Withholding of increments of pay	3,485
(v) Withholding of promotion for a specified period	25
(vi) Other minor penalties like censure, withholding of the privileges of Passes or Privilege Ticket Orders or both, fine	702
(vii) Prosecuted and convicted	5
(viii) Action not yet finalised	219
Total	5,137*

*NOTE—A few of the errant staff either lost their lives or could not otherwise be proceeded against.

Accidents at Level Crossings

85. Accidents at level crossings are collisions between trains and road vehicles. These pose a danger primarily for the road user and to a lesser degree for the railway. During the last five years, such accidents resulted in the death of 225 persons travelling by road vehicles and injuries to another 846. It is noteworthy that train collisions during the same period caused 255 deaths and injuries to 1955 persons and derailments of trains caused 202 deaths and injuries to another 1250. Accidents at level crossings thus assume importance.

86. Level crossings are classified according to their importance as Special Class, A Class, B Class, C Class and D Class in consultation with State Governments. This classification is determined by the nature of the road and the density of road and rail traffic and indicates the structural character of the level crossing and the precautions necessary for protection of both road and rail traffic. The number of different types of level crossings is shown below:—

TABLE 16

Types of Level Crossings								Number
Special Class	..	..	..	..	..	..	..	249
A Class	..	..	..	..	..	..	..	1,229
B Class	..	..	..	..	..	..	..	3,540
C Class (Manned)	..	..	..	..	..	..	..	11,282
C Class (Unmanned)	}	..	..	..	..	..	..	26,085
D Class (Cattle crossings)		..	..	..	..	..	..
Total	..	..	..	..	..	..	..	42,385

87. There are at present 16,300 manned level crossings and 26,085 un-manned level crossings. In other words, 38 per cent are manned level crossings and 62 per cent are unmanned level crossings. At the end of 1963, 34 per cent were manned level crossings and 66 per cent, unmanned level crossings.

88. The number of accidents at manned and numanned level crossings during the last five years on all gauges is shown below:—

TABLE 17

Year	Number of accidents at level crossings		Total
	Manned	Unmanned	
1963-64	56	108	164
1964-65	38	95	133
1965-66	48	80	128
1966-67	27	77	104
1967-68	33	81	114
Total	202	441	643
Percent age	31.4	68.6	100.0

89. A perusal of the figures would show that nearly 69 per cent of the accidents at level crossings occurred at unmanned level crossings which constitute 62 per cent of the total number of level crossings. The remaining 31 per cent of the accidents at level crossings took place at manned level crossings which constitute 38 per cent of the total number of level crossings. This broadly confirms the conclusion drawn by the Kunzru Committee that the manning of the level crossings does not provide a completely satisfactory remedy against accidents at level crossings.

90. The number of accidents per manned and unmanned level crossing on the different railways during the six years ending with 1962-63 and the five years ending with 1967-68 is given in Annexure XXXVII. It will be seen that the incidence of accidents per manned and unmanned level crossing taken separately as well as together has fallen during the last five years as compared with the six years ending with 1962-63. The reduction has been to the extent of 50 per cent.

91. Taking passenger and goods trains separately, the number of accidents at manned and unmanned level crossings for each type of train on the broad and the metre gauges is brought out in the Annexure XXXVIII. It would be observed that on both the gauges, more passenger trains were involved in accidents at level crossings than goods trains, the disparity being greater in case of metre gauge. The number of accidents at manned level crossings involving passenger trains has increased from 9 to 14 on the broad gauge and from 1 to 5 on the metre gauge during 1967-68 as compared to the previous year. Moreover, at manned level crossings, 14 passenger trains were involved in accidents against 10 goods trains on the broad gauge and 5 passenger trains against 4 goods trains on the metre gauge. This is a disturbing feature as passenger trains run to a fixed schedule which is known to gate-men and there should be less reason for their being taken unawares.

92. The number of accidents at level crossings on the broad gauge and metre gauge in correlation with train kilometres is given in Annexure XXXIX. The figures would show at a glance that the rate per million train kilometres was less during the last five years as compared with the six years ending with 1962-63. The trend has been more or less downward. Whereas on the broad gauge, it remained static during the last three years, there was a reversal of the trend on the metre gauge during 1967-68. We hope this is a sporadic feature and the downward trend will be resumed. The picture would be complete only if density factor of road traffic were available which unfortunately was not.

93. The incidence of accidents at level crossings involving passenger and goods trains—over all and on different Railways—in correlation with the density of traffic is brought out in Annexure XL and XLI respectively.

94. The incidence involving passenger trains per million passenger train kilometres showed an upward trend on the broad gauge during the last two years and a reversal of the declining trend in 1967-68 on the metre gauge. In case of goods trains, the trend was throughout downward on the broad gauge but got reversed on the metre gauge in 1967-68. The highest incidence of accidents at level crossings was on the Northeast Frontier Railway and the next highest on the North Eastern Railway in the case of both passenger and goods trains.

95. We next analyse the incidence of accidents at manned level crossings according to different causes. The result is shown in the following table:—

TABLE 18

Causes	Number	Percentage
Due to open or improperly closed or secured gate ..	98	48.5
Drivers disregarding signals	7	3.5
Road vehicles coming over the level crossing when barrier on one side is closed	17	8.5
Road vehicles crashing into the lifting barrier or swing type gates or breaking the lock and opening the gate	28	13.8
Road vehicles breaking or opening the chain at a level crossing closed by chains	8	3.9
Road vehicles left at level crossing or infringing the track ..	15	7.4
Other causes	29	14.4
Total	202	100.0

96. The staff held responsible for causing accidents at manned level crossings during the last five years comprised 94 gatemen, 21 drivers and 29 others. Apart from these, 126 road users were held responsible. This implied that in these accidents about 53 per cent railway staff and 47 per cent road users were involved in acts of omission or commission. This position is also reflected in the cause-wise analysis given in the foregoing paragraph wherein 52 per cent of the accidents at level crossings could be directly attributed to the failure of the railway staff, the remaining being mainly due to the fault of road users.

97. This position, as it has developed, is at variance with the picture drawn by the Kunzru Committee which found that only 12 per cent of the accidents at manned level crossings were due to the failure of road users.

98. We also considered it relevant to examine the position regarding the punishments imposed for lapses resulting in accidents at level crossings. This is shown below:—

TABLE 19

Nature of punishment	Number
Removal from service	30
Compulsory retirement .. .. .	..
Reduction in (a) rank	12
(b) grade	4
Withholding of promotion	4
Withholding of increments —	
(a) Recurring	31
(b) Non-recurring	26
Prosecuted and convicted	30
Cases subjudice	1
Cases under investigation .. .. .	..
Total of Railway staff	144
Road users prosecuted and convicted	45

99. A study was conducted of the types of road vehicles involved in accidents at level crossings—both manned and unmanned—during the last five years with a view to pinpointing the type of road user on whom attention should be concentrated. The results are given in the following table:—

TABLE 20

Types of Road Vehicles	Number	Percentage
Motor trucks	249	38.8
Passenger buses	39	6.1
Taxis, cars and jeeps	48	7.4
Tractors	25	3.9
Tongas	3	0.4
Bullock carts	182	28.4
Others	97	15.0
Total	643	100.0

100. It will be seen that the largest proportion of the accidents at level crossings involved motor trucks, the bullock carts coming second. Between themselves, these two were involved in about 67 per cent or two-thirds of all the accidents that occurred at the level crossings during the last five years. This lends support to the commonly held impression that truck drivers are the most reckless in driving and the bullock cart drivers too indolent to care.

101. We also considered it fit to examine the distribution statewide of level crossing accidents—both manned and unmanned—and the casualties resulting therefrom statewide. The position is shown below:—

TABLE 21

Name of State	Number of level crossing accidents at			Casualties		
	Manned	Unmanned	Total	Killed	Injured	Total
Assam	16	16	32	5	39	44
Andhra	14	53	67	43	142	185
Bengal (West)	31	49	80	32	89	121
Bihar	27	43	70	47	114	161
Gujarat	7	47	54	12	85	97
Haryana	6	5	11	1	25	26
Himachal	..	1	1	..	..	..
Kerala	2	5	7	5	35	40
Madhya Pradesh	8	39	47	8	21	29
Maharashtra	6	12	19	15	48	63
Madras	4	47	51	11	33	44
Mysore	14	19	33	5	46	51
Orissa	2	12	14	3	38	41
Punjab	10	30	40	12	31	43
Rajasthan	8	17	25	19	85	104
Uttar Pradesh	47	46	93	7	15	22
Total	202	44	643	225	846	1071

102. The number of accidents at level crossings according to time blocks of four hours each is shown below :—

TABLE 22

Time Blocks	Number of accidents at level crossings		Total Number
	Manned	Unmanned	
0—4	44	57	101
4—8	35	71	106
8—12	31	73	104
12—16	29	94	123
16—20	23	94	117
20—24	40	52	92
Total	202	441	643

103. It would be seen that the number of accidents at manned level crossings was the highest during 0 to 4 hours closely followed by that during 20 to 24 hours. In the 8 hours period from 20 hours at night to 4 hours in the morning, 42 per cent of the total number of accidents occurred. The remaining 58 per cent occurred during the remaining 16 hours i.e., from 4 to 20 hours. The need for intensive and surprise checks of gates at night is thus clearly indicated.

104. On the other hand, the largest number of accidents at unmanned level crossings, i.e. about 38 per cent of the total number of accidents at unmanned level crossings occurred during the hours of total daylight i.e., from 8 to 16 hours and another 37 per cent during the hours of partial daylight viz. 4 to 8 hours and 16 to 20 hours. This is probably due to the fact that the nature of traffic using unmanned level crossings move mainly during the day.

Fires in Trains

105. A fire in a running train—passenger or goods—is treated as a train accident on the Railways. The Kunzru Committee had recommended that in order to bring the definition of fires in trains on the Indian Railways in consonance with the practice on some of the railways abroad, a fire in a train should be treated as a train accident when it resulted in death or injury or in loss of property of Rs. 500 or more. Accordingly, the definition of fires was revised in the middle of 1964. With effect from the year 1964-65, thus, cases involving loss of property less than Rs. 500 and

not resulting in death or injury were excluded from the figures of fires in trains and began to be accounted for under miscellaneous accidents. In the light of the revised definition, thus, the number of cases of fires in trains as would be seen from the figures which follow, fell sharply in the years 1964-65 onwards. Comparison of the figures in this category of accidents during the five years 1963-64 to 1967-68 with the figures of the preceding six years ending 1962-63 is, therefore, not tenable.

106. With the revised definition, the fires in trains during the years 1963-64 to 1967-68 constituted 4.4 per cent of the total number of important accidents. These, however, resulted in 25.4 per cent of deaths, 9.9 per cent of injuries to passengers and staff and 13.4 per cent of the loss to property, compensation claims etc. The significance of this category of accidents is thus evident.

107. The yearwise position in respect of fires in trains on the two gauges during the last five years as compared with the six years ending 1962-63 is given in the table below:—

TABLE 23

Year	Broad gauge		Metro gauge	
	No.	Rate per million train kilometres	No.	Rate per million train kilometres
1957-58	221	.87	73	.56
1958-59	254	1.0	97	.75
1959-60	199	.75	91	.68
1960-61	264	1.0	109	.81
1961-62	157	.56	69	.50
1962-63	142	.50	93	.68
Average for six years	206	.81	89	.68
1963-64	77	.28	35	.26
1964-65	21	.08	10	.07
1965-66	32	.11	10	.07
1966-67	34	.11	19	.13
1967-68	26	.09	16	.11
Average for five years	38	.13	18	.13

108. As would be seen from the table above, the incidence of fires in trains as also the rate per million kilometres showed a steep fall on both the gauges during the years 1963-64 to 1967-68 compared with the preceding six years. This, however, as stated earlier was primarily because of the exclusion from the definition of fires in trains of a large number of cases of fire.

109. Confining our attention to the position during the last five years, it would be observed from the table above that the average incidence of fires in trains per million train kilometres was identical on the two gauges even while the number of fires in trains on the broad gauge was nearly double that on the metre gauge. On neither of the two gauges was there a consistency in the trend and fluctuations took place from year to year.

110. Taking passenger and goods trains separately on the two gauges and correlating their incidence with the traffic density factor, the position which emerges is shown in Annexure XLII. It will be seen that the incidence of fires involving passenger trains on the broad gauge in 1967-68 showed a welcome reversal of the upward trend which became manifest from 1964-65 to 1966-67. In the case of goods trains, the incidence remained static over the last two years. A comparison with 1963-64 is not quite valid since as mentioned a change in definition occurred in 1964-65. On the metre gauge the incidence of fires in trains involving passenger trains showed a fluctuating tendency. In the case of goods trains, however, the incidence stayed at a steady low level. Here it may be observed that during the last two years, namely, 1966-67 and 1967-68, the incidence of fires in passenger trains per million passenger train kilometres was much higher on the metre gauge than on the broad gauge. Considering that overall, the passenger train kilometres on the broad gauge are nearly twice that on the metre gauge, the relatively higher incidence of fires in trains on the metre gauge cannot but be viewed with concern.

111. On individual railways, the position in respect of fires in trains on the two gauges during the last five years correlated to the traffic density factor was as shown in Annexure XLIII. The incidence of fires in trains, it will be seen, has been substantial on the Southern, the Central, the Eastern and the South Eastern Railways.

112. Taking the cases of fires on passenger and goods trains separately on each of the Railways, the position is shown in Annexure XLIV. It will be seen that three-fourths of the cases of fires in trains took place on passenger trains and only one-fourth on goods trains. It would also be noted that the incidence of fires in passenger trains on the broad gauge was more than double that of the goods trains and on the metre gauge, more than six times that of the goods trains.

113. In the table which follows, we analyse the causes of fires in passenger trains on the different Railways during the years 1963-64 to 1967-68;

TABLE 24

Causes		C.R.	E.R.	N.R.	N.E.R.	N.F.R.	S.R.	S.C.R.	S.E.R.	W.R.	Total
1. Defects in or failure of electrical equipment or short-circuiting of electrical wires.	No.	4	14	8	4	..	19	..	16	2	67
	A	12.5	40.0	53.3	22.2	..	34.0	..	84.1	18.0	31.0
	B	6.0	20.9	12.0	8.0	..	28.3	..	23.8	3.0	100.0
2. Sparks from engines	No.	..	6	..	4	..	8	3	..	1	22
	A	..	17.1	..	22.2	..	14.3	23.1	..	9.0	10.5
	B	..	27.3	..	18.2	..	36.4	13.6	..	4.5	100.0
3. Negligence of passengers and other outsiders e.g. bidi & cigarette ends thrown carelessly, lighting of fires in carriages, carrying of inflammable goods etc.	No.	3	9	..	7	10	6	..	1	2	38
	A	9.4	25.7	..	39.0	91.0	10.7	..	5.3	18.0	18.1
	B	7.9	23.7	..	18.4	26.3	15.8	..	2.6	5.3	100.0
4. Negligence of railway staff, e.g. improper examination of loading of explosives, dangerous or inflammable goods, rough shunting, wrong marshalling etc.	No.	1	1	..	..	..	18	5	..	..	25
	A	3.1	2.9	..	..	..	32.1	38.4	..	..	11.9
	B	4.0	4.0	..	..	..	72.0	20.0	..	..	100.0
5. Accidental e.g., wire contacts due to pilferage of fittings, overheating of paint etc.	No.	3	4	3	..	1	4	..	1	..	16
	A	9.4	11.4	20.0	..	9.0	7.1	..	5.3	..	7.6
	B	18.7	25.0	18.7	..	6.3	25.0	..	6.3	..	100.0
6. Cause not determined.	No.	21	1	4	3	..	1	4	1	6	41
	A	65.6	2.9	26.7	16.6	..	1.0	30.8	5.3	55.0	19.5
	B	51.2	2.4	9.8	7.3	..	2.4	9.8	2.4	14.7	100.0
7. Cases not finalised	No.	..	..	..	..	..	1	..	..	..	1
	A	..	..	..	..	..	7.7	..	..	..	0.5
	B	..	..	..	..	..	100.0	..	..	..	100.0
8. Total	No.	32	35	15	18	11	56	13	19	11	210

A—Percentage of the cause to the total on each Railway.

B—Percentage of the cause on each railway to the total of all railways.

114. It will be seen that 67 cases forming 32 per cent of fires in passenger trains resulted from defects or failures of electric equipment or short-circuiting of electric wires. As had been brought out in the beginning of this study of fires in trains, comparison with earlier years is not tenable due to a change in definition. Nevertheless, it may be relevant to state that

during the preceding 6 years ending 1962-63, defects in electrical equipment or short-circuiting etc., had accounted for 35 per cent of fires in passenger trains. This cause has thus continued to be the most important single factor resulting in fires in trains.

115. Sparks from engines were responsible for about 11 per cent of the cases of fires in passenger trains. Here too, it may be observed that during the six years ending 1962-63, sparks from engines had accounted for 18 per cent of fires in passenger trains. Since then a fair number of passenger trains have been brought onto electric and diesel traction.

116. Negligence of passengers and railway staff was responsible for 18 and 12 per cent respectively of fires in passenger trains during the last 5 years. As against this during the preceding 6 years the relative contribution of these causes had been 10 and 3 per cent respectively. The directions in which action is called for, as for instance punitive action against defaulting staff, intensification of propaganda about the hazards of careless acts on the part of the passengers etc., are thus clearly indicated.

117. Cases of fires classified as 'accidental' during the last 5 years numbered 16 in all and constituted 7.6 per cent of the fires in passenger trains. In 41 cases, or nearly 20 per cent, of fires in passenger trains, the cause could not be established. The position was the worst on the Central Railway on which 21 out of the 41 such cases remained undiagnosed. Taking the cases of fires in trains on the Central Railway itself of which there were 32 in all, the Central Railway was thus unable to determine the cause in 21 or nearly 66 per cent. This Railway even in the preceding 6 years had been unable to determine the cause in 78 per cent of its cases of fires in passenger trains. This is indeed a highly unsatisfactory state of affairs. We are unable to see any special reasons why the Central Railway should be less able to locate the cause of fires in passenger trains than its other counterparts and should accept that position with complacency.

118. The causes of fires in goods trains are analysed in Annexure XLV under the same headings as in the case of passenger trains. It will be seen that the highest contributory factor in fires in goods trains was the negligence of railway staff and the next highest the negligence of outsiders etc.

119. We conclude the study of fires in trains by indicating the number of staff held responsible for fires in trains. The position is given in the table below:—

TABLE 25

Categories of staff	Number
Electric staff	11
Station staff	8
Engine crew	24
Guards	7
Other staff	16
Total	66

120. The punishments awarded to staff held responsible for causing fires in trains are shown below:—

TABLE 26

Nature of punishment	Number of staff
(i) Removal from service	3
(ii) Reduction in rank	3
(iii) Withholding of increments	35
(iv) Withholding of promotion for a specified period	1
(v) Other punishments like fines, censure, etc.	28
(vi) Cases in which punishments not yet finalised	1
Total	66

Accidents on Narrow Gauge Sections

121. The narrow gauge sections worked by the Government Railways consist of two different gauges—some of 0.762 metres (2 ft. 6 inches) gauge and others of 0.610 metres (2 feet) gauge, the former of the two predominating. The distribution of narrow gauge kilometrage on the different Railways as on 31-3-1967 and their percentage to the total narrow gauge route kilometrage on the Government Railways is brought out in the following table:—

TABLE 27

Railway	0.762 m. (2'-6") Gauge	0.610 m. (2'-0") Gauge	Total	Percentage to total Narrow Gauge kilo- metrage on Govern- ment Railways.
Central	334.54	462.02	796.56	18.4
Eastern	79.84	..	79.84	1.8
Northern	259.56	..	259.56	5.9
Northeast Frontier .. .. .	..	87.48	87.48	2.1
Southern	156.76	..	156.76	3.6
South Central	370.18	..	370.18	8.6
South Eastern	1,381.04	..	1,381.04	31.9
Western	1,134.82	66.92	1,201.74	27.7
Total	3,716.74	616.42	4,333.16	100.0

122. The incidence of the four important categories of accidents on the narrow gauge sections of the Railways during the five years from 1963-64 to 1967-68 is shown in the table below in juxtaposition with the incidence during the six years ending 1962-63 :—

TABLE 28

Years	Collisions		Derailments		Accidents at level crossings		Fires in Trains		Total	
	A	B	A	B	A	B	A	B	A	B
Six years 1957-58 to 1962-63	11	·17	606	8·8	83	1·22	82	1·22	782	11·4
Five years 1963-64 to 1967-68	9	·16	315	5·5	49	·85	4	·07	377	6·6

NOTE: A—Number of accidents.

B—Rate per million train kilometres.

123. It will be seen that the number of accidents on the narrow gauge came down substantially during the last 5 years, the yearly average having declined from about 130 to about 75. The extent of reduction works out to nearly 42 per cent. The decline is reflected in the incidence of all categories of accidents except collisions where the incidence during the two periods was more or less equal.

124. During the last five years, there were nine collisions on the narrow gauge, all involving passenger trains. Of these, six were between two trains including between a train and a light engine. Reception of trains on blocked line or incorrect setting of points were the causes of six of the collisions. One each was caused by disregard of signals by driver, due to vehicles escaping and due to despatch of a train into a section occupied by another train or vehicles.

125. Derailments constituted 83·6 per cent of all the important accidents on the narrow gauge. Year-wise incidence of these derailments is shown in Annexure XLVI. It will be seen that even while the number of derailments involving passenger trains was somewhat higher than that involving goods trains, the incidence for goods trains when correlated to the traffic density factor was nearly double that for passenger trains. This pattern is discernible more or less uniformly throughout the last five years. From year to year, there have been fluctuations in the trend of incidence in the case of both passenger and goods trains.

126. The position in respect of derailments over the individual Railways correlated to the density factor during the last 5 years is shown in the Annexure XLVII. The position in respect of preceding 6 years ending 1962-63 appears in juxtaposition.

127. The nature and extent of the causes of derailments is indicated in the table below. Station and midsection derailments have been classified separately for the purpose of this analysis.

TABLE 29

Causes	Passenger trains				Goods trains				Total			
	At Stations		Mid-Section		At Stations		Mid-Section		At Stations		Mid-Section	
	No.		No.		No.		No.		No.		No.	
	%		%		%		%		%		%	
1. Failures of staff ..	14	33.3	14	11.7	12	46.2	34	26.5	26	38.3	48	19.4
2. Permanent Way failures ..	4	9.5	12	10.1	2	7.7	13	10.1	6	8.8	25	10.1
3. Carriage and Wagon defects ..	3	7.1	17	14.3	6	23.1	44	34.4	9	13.2	61	24.8
4. Engine defects ..	9	21.5	17	14.3	4	15.4	1	0.8	13	19.1	18	7.3
5. Miscellaneous ..	12	28.6	59	49.6	2	7.6	36	28.2	14	20.6	95	38.4
6. Total ..	42	100.0	119	100.0	26	100.0	128	100.0	68	100.0	247	100.0

128. Failure of staff accounted for 74 out of 315 derailments, i.e., nearly 24 per cent. Of these 74 derailments, 48 occurred between stations and the remaining at stations. In the preceding 6 years, failure of staff had resulted in 115 derailments which constituted 19 per cent of the total. The specific failures which led to the derailments included 9 cases of incorrect setting or non-locking or faulty manipulation of points, 17 cases of defective or uneven loading and 19 cases of excessive speed. These cases between themselves thus accounted for a majority of derailments attributable to staff failures, i.e., about 61 per cent.

129. The total number of derailments attributable to track defects was 31 which formed about 10 per cent of the total derailments. During the preceding 6 years, this factor had accounted for 13 per cent. Of the 31 derailments caused by track defects, 25 occurred between stations and 6 at stations. Furthermore, 16 of the derailments attributed to track defects involved passenger trains.

130. Carriage and Wagon defects accounted for 70 out of 315 or nearly 22 per cent of the derailments. During the preceding six years ending 1962-63, nearly one-third of the 448 derailments had been due to this cause. Of the 61 midsection derailments ascribable to carriage and wagon defects, 17 involved passenger trains and 44 goods trains. Of the 9 station derailments due to this cause, 3 were passenger train derailments.

131. The break-up of the nature of defect or defects which led to the 70 derailments attributed to carriage and wagon defects is in Annexure XLVIII.

132. Engine defects accounted for 31 derailments during the last five years, of which 18 were in midsection and the remaining 13 at stations. Of the 18 midsection derailments, 17 involved passenger trains and of the 13 station derailments 9 were of passenger trains. In other words, about 84 per cent of the derailments put down against engine defects involved passenger trains. Of the 31 derailments caused by engine defects, 6 were due to broken or defective springs or suspension, another 6 due to defective wheels or tyres and 5 due to broken axles or journals.

133. The Kunzru Committee had observed that the high incidence of derailments due to carriage and wagon and engine defects was partly due to the high percentage of overaged locomotives and rolling stock on the narrow gauge. The position obtaining then and now is brought out in Annexure XLIX. It will be seen that:—

- (i) the percentage of overaged locomotives has increased on all the Railways except the Northern. On the Northeast Frontier Railway, all the locomotives on 31-3-1968 were overaged.
- (ii) the percentage of overaged coaches has come down on all the Railways except the Eastern which had all its 88 carriages overaged on 31-3-1968. On this date, about half of the coaches on all the narrow gauge sections were overaged as against 60 per cent on 31-3-1963.
- (iii) Apart from a slight reduction in the percentage of overaged stock on the Northern, the Southern and the South Eastern Railways, all the other Railways had an increased percentage. Particularly, on the Eastern and the Southern Railways, the number of overaged stock was high being 81 out of 83 on the Eastern and 75 out of 92 on the Southern.

134. We next turn to the accidents at level crossings on the narrow gauge sections. Figures of such accidents in terms of million train kilometres on the narrow gauge sections during the 5 years ending 1967-68 are given in the Table below:—

TABLE 30

Year						Number	Rate per million train kilometres
1963-64	..	..	..	..	..	16	1.4
1964-65	..	..	..	..	..	5	0.44
1965-66	..	..	..	..	..	10	0.88
1966-67	..	..	..	..	..	8	0.69
1967-68	..	..	..	..	..	10	0.85
Total	..	..	..	..	..	49	0.85

135. It would be seen from the table that the trend has been a fluctuating one. All the level crossing accidents which took place on the narrow gauge sections during the years were at unmanned level crossings.

136. The incidence in respect of passenger and goods trains is shown in the Annexure I. It will be seen that the number of passenger trains involved in accidents at level crossings was about twice that involving goods trains even though in terms of million train kilometres, the incidence was almost equal. On individual Railways, the break-up of accidents at level crossings was as shown in Annexure I.I. It will be seen that the incidence of accidents at level crossings has been the heaviest on the Western and the Northeast Frontier Railways.

137. On the narrow gauge sections, only 4 cases of fire—3 on the South Eastern Railway and 1 on the Northern Railway—occurred during the 5 years ending 1967-68. Two of these cases involved passenger trains and the other two goods trains.

Technical Accidents

138. It will be recalled that in paragraph 3 of Chapter I, it had been stated that in addition to the four important categories of railway accidents, we proposed also to take into consideration certain other categories which are accidents only in a technical sense. Having surveyed the position in regard to the important categories of accidents, we now turn to these technical accidents. What divides these technical accidents from actual mishaps is only a fortuitous circumstance which with or without a last minute action by an individual may save a train from actual disaster. But for this, these occurrences have all the elements of incipient tragedy. Any measures which aim at preventing these occurrences would *ipso facto* go to reduce the chances of more serious accidents. We consider three categories, namely, breach of block rules, drivers disregarding signals and averted collisions.

Breach of Block Rules

139. Basic rules of train working prescribed to ensure the safe running of trains are commonly referred to as block rules and an instance of their violation is known as a case of breach of block rules. The nature of lapse which leads upto a breach of block rules is fundamentally not very different from an act of omission or commission which results in an accident with more serious consequences. From the Railway Administration's point of view, a case of breach of block rules is an accident even though only technically so.

140. The incidence of breach of block rules on the broad and the metre gauges during the last five years was as follows:—

TABLE 31

Year	Broad Gauge		Metro Gauge		Total	
	Number	Rate per million train kilometres	Number	Rate per million train kilometres	Number	Rate per million train kilometres
1903-64	40	·15	40	·30	80	·19
1964-65	36	·13	38	·28	74	·18
1965-66	22	·08	35	·25	57	·13
1966-67	22	·08	32	·23	54	·12
1967-68	21	·07	20	·14	41	·09
Total	141	·10	165	·24	306	·14

141. While no doubt a steadily falling trend is noticed in the number of cases as also the rate per million train kilometres on either of the two gauges, the figures will show that the rate per million train kilometres on the metre gauge was consistently higher than on the broad gauge being 2 to 3 times as high. Considering that train kilometres on the metre gauge are about half of those on the broad gauge, the incidence on the metre gauge assumes an unduly high proportion.

142. The incidence of breach of block rules correlated to the traffic density factor is shown in Annexure LII indicating separately the number of cases involving passenger and goods trains.

143. The Kunzru Committee had also studied the incidence of breach of block rules during the course of their analysis but they had confined their attention in this behalf only to passenger trains for a period of five years from 1957-58 to 1961-62. During those five years, the number of block irregularities was 128 on the broad gauge and 83 on the metre gauge. As against this, the corresponding figures for the years 1963-64 to 1967-68 relating to passenger trains were 79 on the broad gauge and 85 on the metre gauge. While thus a distinct decline has been recorded on the broad gauge, the position on the metre gauge remained, more or less, as in the previous years.

144. The position on individual Railways as far as cases of breach of block rules are concerned, was as brought out in Annexure LIII. The heaviest incidence of cases of breach of block rules on the broad and metre gauges respectively was on the Central and the Southern Railways as brought out in this annexure.

145. An analysis of the nature and extent of the irregularities committed by the staff in these cases of breach of block rules is attempted in the table below:—

TABLE 32

Causes		Broad Gauge	Metre Gauge	Total
1. Despatching of trains without obtaining permission to approach or despatching a train in an occupied section or closing the line when the section is not clear or giving permission to approach when conditions for giving permission to approach are not fulfilled or starting a train on the line clear of another train.	Number	23	21	44
	Percentage	16.38	12.73	14.38
2. Trains entering a section without an authority to proceed or with an incorrect authority to proceed (not resulting in collision or averted collision).	Number	69	104	163
	Percentage	41.84	63.03	53.27
3. Reception of trains on blocked lines or wrong line or despatching into a wrong line by incorrect setting of points (not resulting in collision or averted collision).	Number	44	30	74
	Percentage	31.2	18.18	24.18
4. Miscellaneous causes	Number	15	10	25
	Percentage	10.58	6.06	8.17
5. Total		141	165	306

146. These figures show that more than half the cases, i.e. 53 per cent, were comprised of drivers entering the block section without an authority or with an incorrect authority to proceed. In 39 per cent cases the irregularities were on the part of the station staff who received trains on blocked lines or despatched them into occupied sections or closed the line when the section was not clear etc. In other words, nearly 92 per cent of the cases of breach of block rules were composed of such irregularities in which either the drivers or the station staff erred.

147. With a view to ascertaining the directions in which preventive action is necessary we have given further consideration to the nature of breach of block rules and the location where they occurred. The results of this investigation are shown in Annexure LIV. It will be seen that block irregularities take place preponderingly on the single line. At the same time, it is not established that the staff are more alert when dealing with passenger trains than goods trains since overall more block irregularities involved passenger trains than goods trains during the last five years.

148. The position on individual Railways in regard to the nature and extent of block irregularities is brought out in Annexure LV. It would be observed that the incidence of block irregularities attributable to both station staff and drivers was the heaviest on the Southern Railway.

149. The various categories of staff held responsible for block irregularities, their number and the punishments awarded to them have been studied in the table given below:—

TABLE 33

Categories of staff	Number held responsible		Nature of punishments awarded				
	No.	Percentage	Removal from service	Reduction in rank or grade	Withholding of increments	Other punishments	Cases not yet finalised
(i) Station masters, Assistant station masters, cabin assistant station masters	192	35.0	14	36	128	14	—
(ii) Switchmen	11	2.0	4	2	5	—	—
(iii) Pointsmen, levermen and cabinmen	46	8.4	6	9	28	3	—
(iv) Drivers & firemen	218	39.8	6	53	133	26	—
(v) Guards	25	4.6	—	—	21	4	—
(vi) Signalling staff	23	4.2	—	6	11	6	—
(vii) Others	30	5.5	3	3	16	8	—
(viii) Cases not yet finalised	3	0.5	—	—	—	—	3
Total	548	100.0	33	109	342	61	3
Percentage			6.1	19.9	62.4	11.1	0.5

150. It will be seen that about 90 per cent cases of breach of block rules were caused by failure of station masters and assistant station masters, switchmen, pointsmen, levermen, cabinmen, guards, drivers and firemen, i.e. station staff and loco running staff.

Disregard of signals by drivers

151. When a driver fails to control his train on the indication of a signal showing 'on' (Danger) aspect, the result not infrequently is a collision, a derailment or an accident at a level crossing. More often, however, due to fortuitous circumstances such consequences do not follow. Even so, failure to observe a signal is treated as an accident technically.

152. The table below shows the number of cases of disregard of signals by drivers—separately in respect of passenger and goods trains—indicating also the number of cases in which collisions, derailments etc., occurred.

TABLE 34

Particulars	Broad Gauge				Metre Gauge				Total			
	Passenger Trains		Goods Trains		Passenger Trains		Goods Trains		Passenger Trains		Goods Trains	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A. Cases of mishap resulting in—												
Collisions	13	4.7	35	8.2	6	7.6	9	7.8	19	5.4	44	8.2
Derailments	14	5.1	128	30.1	13	16.5	42	36.2	27	7.6	170	31.4
Accidents at level crossings	2	0.7	2	0.5	..	..	2	1.7	2	0.6	4	0.7
Total ..	29	10.5	165	38.8	19	24.1	53	45.7	48	13.6	218	40.3
B. Cases where no mishap resulted	246	89.5	260	61.2	60	75.9	63	54.3	306	86.4	323	59.7
Grand Total	275	100.0	425	100.0	79	100.0	116	100.0	354	100.0	541	100.0

153. Of the 266 cases of disregard of signals which resulted in mishaps, 48 related to passenger trains.

154. The total number of cases of disregard of signals on the two gauges during the last five years 1963-64 to 1967-68 compared with the preceding six years is shown in the table below:—

TABLE 35

Gauge	1957-58 to 1962-63		1963-64 to 1967-68	
	Total number of cases	Average number of cases per year	Total number of cases	Average number of cases per year
Broad Gauge	..	..	..	..
Metre Gauge	..	..	..	..
Total	..	..	..	..
	1049	175	700	140
	226	37	195	39
	1275	212	895	179

155. It will be seen that there has been a substantial reduction in the average number of cases of disregard of signals overall as also on the broad gauge. On the metre gauge, however, there was a marginal deterioration.

156. The yearwise incidence during the years 1963-64 to 1967-68 is brought out in Annexure LVI. The rate per million train kilometres is also juxtaposed. It will be seen that there was a steady decline both on the broad gauge and in the total in the 3 years from 1964-65 till 1966-67 in the number of cases as also the rate per million train kilometres. On the metre gauge, the position kept fluctuating during these three years. However, in the year 1967-68, there was a slight setback in the position. We hope this was a temporary phase and would be got over.

157. On individual railways, the incidence of disregard of signals was as shown in Annexure LVII. The position for the broad and the metre gauges is indicated separately. The traffic density factor in terms of million train kilometres is correlated. The annexure shows that the incidence of disregard of signals in respect of both passenger and goods trains was the heaviest on the Western Railway on the broad gauge and the North Eastern Railway on the metre gauge.

158. We now come to the number of instances in which the different types of signals were disregarded on the two gauges during the five years from 1963-64 to 1967-68. This and the comparative position for the preceding years are shown in Annexure LVIII.

159. It will be seen that on the broad gauge, the average number of cases in respect of each type of signal came down in the years 1963-64 to 1967-68 when compared with the preceding six years, except where two or more signals were disregarded together. As for the number of cases in which two or more signals were disregarded together, the position remained more or less the same, the yearly average having come down from 23 to 22. Signals on automatic territory were disregarded to the extent of nearly 7 per cent of the total number. On the metre gauge, there was an increase in the incidence of disregard of approach signals and a marked deterioration in respect of departure signals. In respect of the latter, the average yearly number increased from 6 to 12 in the two periods compared. In the case of disregard of two or more signals together the position did not alter materially. Overall, there was a deterioration of the position on the metre gauge which deserves due notice of the Railways concerned.

160. The number of instances in which the different types of signals were disregarded on the various railways is shown in Annexure LIX. The position relating to the two gauges is shown separately in this Annexure. A perusal of this annexure will show that there was some deterioration on the South Eastern, the Western, the Southern and the Northern Railways during the years 1963-64 to 1967-68 as compared with the preceding six years.

161. It may here be remarked that disregard of two signals or more at the same time by a driver indicates not merely a momentary lapse but a total aberration of the faculties of perception and control. In fact, during the last five years, on no less than 19 occasions, three signals or more were disregarded together and in 6 cases all the four signals of a station were

ignored at the same time. We suggested that this would be a fruitful field for study of the Psycho-Technical Cell who may, as a result of the study, be placed in a position to indicate the line of action by which matters can be remedied.

162. The incidence of disregard of signals according to the types of signalling in use on the different railways is brought out in Annexure LX. Nearly 81 per cent of the cases of disregard of signals on the broad gauge and 78 per cent of such cases on the metre gauge took place at stations provided with lower quadrant two-aspect signalling. Signals were disregarded on 65 occasions on the broad gauge and on 27 occasions on the metre gauge at stations equipped with multiple aspect upper quadrant signalling. In another 47 cases on the broad gauge and 13 cases on the metre gauge, colour light signals were disregarded. The need for educating drivers in observing the aspects of multiple aspect signals and reading their indications correctly is thus highlighted.

163. We endeavoured to inter-relate the incidence of disregard of signals with the service record and allied particulars of individual errant drivers to see if any pattern emerged therefrom. The position is shown in Annexure LXI. Relating the incidence to the total service of the errant drivers, it will be seen that the largest number of instances involved drivers with less than 5 years service followed by drivers whose length of service ranged from 5 to 10 years. This is as it should be since in the cadre of drivers the largest number is composed of those who have less than 5 years experience as drivers. The curious phenomenon, as revealed by the study, however, is that drivers with more than 15 years of service were involved in disregard of signals oftner than those with service ranging from 10 to 15 years. The data available with the Committee are too meagre to state that after a certain number of years of service the driver is apt to become over-confident and thereby less alert and responsive to the dictates of signals. Nonetheless this phenomenon may present another useful field for study for the Psycho-Technical Cell.

164. The annexure would also show that of the drivers held responsible for the disregard of signals, 31 per cent had previous punishments for accidents or other similar lapses and another 32 per cent, for other irregularities during a period of 3 years prior to their disregarding the signal. For about 36 per cent of the drivers, however, this was the first offence. Needless to say, a driver who disregards a signal is an incipient accident maker and should be classified as accident prone. Public safety demands that he should as far as possible not be put on driving duty thereafter.

165. Of the 682 drivers held responsible for the disregard of signals, 427 or over 60 per cent were in the age group of 45 years or less. More than half of the drivers, 367 in all, were using spectacles. These figures also might furnish useful data for a clinical study of drivers by the Psycho Technical Cell.

Averted Collisions

166. A breach of rules may take the shape of a block irregularity or a case of a driver passing a signal at danger and may rest at that; or it may lead to a situation in which a collision either occurs or is averted. The averted collision thus, differs from other technical accidents in the degree

of gravity of the potential danger. An averted collision has been defined as a circumstance under which, but for the vigilance shown by any person or persons a collision would have occurred between two trains or between a train and an obstruction. The danger of a collision in such a situation thus remains imminent till the train or trains finally come to a stop short of an actual impact. This element is absent in the case of a mere block irregularity or disregard of a signal by a driver.

167. The number of averted collisions on the broad and the metre gauges during the five years from 1963-64 to 1967-68 were 157 and 89 respectively. The corresponding figures for the six years ending with 1962-63 were 343 and 175. The marked reduction in the number of averted collisions on both the gauges is obvious.

168. In the following table, the incidence of averted collisions per million train kilometres is shown for the broad and the metre gauges during the last five years.

TABLE 36

Year	Broad Gauge		Metre Gauge	
	Number	Rate per million train kilometres	No.	Rate per million train kilometres
1963-64	40	·15	22	·17
1964-65	32	·12	23	·17
1965-66	21	·07	21	·15
1966-67	37	·13	8	·06
1967-68	27	·09	15	·11
Total	157	·11	89	·13

169. The trend though heading downward when viewed over a long period has nonetheless been fluctuating within narrow limits on both the gauges. The incidence correlated to density factor has generally been higher on the metre gauge than that on the broad gauge.

170. The position on the different Railways in regard to the incidence of averted collisions correlated to density of traffic is in Annexure LXII.

171. The nature of averted collisions on the different Railways separately for the broad and the metre gauges is given in Annexure LXIII. The largest number of averted collisions occurred between two trains including between a train and a light engine on both the gauges. Next came averted collisions between a train and a rake or vehicles or load stabled on a running line. This again, as in the case of collisions, highlights the need for enforcing the use of lever and slide collars until track circuiting becomes available. The incidence of each type of averted collisions was higher on the broad gauge as compared to the metre gauge.

172. The nature and frequency of lapses leading to averted collisions on the broad and the metre gauge systems of different Railways are brought out in the following table :—

TABLE 37

Railways	Reception of a train on a blocked line due to line occupied or due to incorrect setting of points 1		Despatching a train into an occupied section 2		Averted collisions in block section or at station due to vehicles escaping 3		Drivers disregarding signals or their failure to control trains 4	
	BG	MG	BG	MG	BG	MG	BG	MG
Central	36	2	3	..	..	..	5	..
Eastern	7	..	3	..	..	..	3	..
Northern	31	4	..	..	..	..	2	..
North Eastern ..	..	20	..	1	..	..	..	5
Northeast Frontier	2	17	..	..	..	..	1	9
Southern	14	11	1	..	..	..	6	3
South-Central ..	3	1	..	..	..	..	2	1
South Eastern ..	8	..	3	..	..	..	2	..
Western	8	9	1	..	1	..	7	1
Total	109	64	11	1	1	..	28	19

Railways	Trolleys not being protected 5		Failure of signalling and interlocking 6		Misc. causes 7		Total (Cols. 1 to 7)	
	BG	MG	BG	MG	BG	MG	BG	MG
Central	1	..	..	..	1	..	46	2
Eastern	1	..	14	..
Northern	1	..	34	4
North Eastern	26
Northeast Frontier	3	26
Southern	1	1	..	..	1	22	16
South Central	1	..	6	2
South Eastern	13	..
Western	1	1	..	1	2	19	13
Total	1	2	2	..	5	3	157	89

173. It would be observed from the above table that the highest number of averted collisions was caused by the reception of trains on blocked lines on both the broad and the metre gauges. Lapses of station staff resulting in averted collisions were far more frequent than those of drivers on either of the two gauges.

174. The categories and number of staff held responsible for causing averted collisions and the nature of punishments awarded to the defaulting staff are shown below:—

TABLE 38

Categories of staff	Number held responsible	Per-cent-age	Nature of punishments	Number of staff	Per-cent-age
1. SMs, ASMs, CASMs ..	163	35.9	1. Removal from service	56	12.3
2. Switchmen, Levermen, Pointsmen	138	30.4	2. Compulsory retirement	4	0.9
3. Shunting Jamadars and other shunting staff, Yard Foreman and other yard staff.	32	7.1	3. Reduction in rank or grade.	180	39.7
4. Guards	15	3.3	4. Withholding increment	151	33.3
5. Drivers and Motormen	64	14.1	5. Withholding promotion	6	1.3
6. PWIs and APWIs ..	1	0.2	6. Other penalties like fine, censure, stoppage of privilege of passes or PTOs or both, etc.	23	5.0
7. Gangmates and Permanent Way Mistries.	4	0.9	7. Prosecuted and convicted	2	0.4
8. Signalling and other interlocking staff.	17	3.7	8. Cases not yet finalised	32	7.1
9. Others	20	4.4	9. Total	454	100.0
10. Total	454	100.0			

175. It will be seen that of the staff found responsible for averted collisions, nearly 78 per cent were traffic staff and 14 per cent loco running staff.

CHAPTER III

SERIOUS ACCIDENTS DURING THE YEARS 1963-64 TO 1967-68— CAUSES AND CONSEQUENCES

176. The public at large are apt to judge the safety of rail travel from the frequency of accidents attended with serious consequences like loss of life and limb or extensive damage to property. This is but natural because it is such accidents which draw banner headlines in the newspapers and receive mention on the radio. It would, therefore, be of interest to analyse accidents of this description during the past few years.

177. According to the rules for reporting of, and enquiring into, accidents contained in Railway Board's Notification No. 59/TTV/42/1/1, dated 11th April 1966, issued in pursuance of the powers under Section 84 of the Indian Railways Act, an inquiry into every serious accident, i.e. an accident to a train carrying passengers attended with loss of human life or grievous hurt or damage to railway property to the extent of Rs. 50,000 or over, by the Additional Commissioner of Railway Safety is obligatory unless the Government set up a Commission of Inquiry under the Commission of Inquiry Act (1952) for the purpose.

178. During the five years, 1963-64 to 1967-68, 79 such accidents occurred on the Indian Railways. In 78 of these accidents, statutory inquiries were held by the Commission of Railway Safety and in one case the inquiry was held by a Commission appointed under the Commission of Inquiry Act, (1952).

179. In order to bring into proper focus the relative importance of such cases, the extent of casualties and damage in the serious accidents *vis-a-vis* the total number of train accidents in important categories involving passenger and goods trains, i.e., collisions, derailments, fires in trains and accidents at level crossings during the years 1963-64 to 1967-68 is given in the table below:—

TABLE 39

S. No.	Accidents	Total number	Casualties			Damage in rupees
			Killed	Injured	Total	
(i)	Accidents in the categories of collisions, derailments, fires in trains and level crossing accidents	6,316	623	3,662	4,285	1,92,68,738
(ii)	All serious accidents*	79	739	2,271	3,010	96,59,858
(iii)	Serious accidents falling under the categories mentioned in item (i)	73	556	2,232	2,788	92,89,814
(iv)	Percentage of (iii) to (i)	1.2	89.2	60.9	65.0	18.9

*These include accidents like explosions, washing away of train by a tidal wave, passengers travelling on the roof hit by overhead structures or branches of trees and killed, persons run over and killed at Luckeesarai etc. which do not fall under item (i).

180. It will be seen that while the serious accidents constituted one per cent of the total number of accidents in item (i), these contributed to 89 per cent of the deaths, 61 per cent of the injuries and 19 per cent of the damage caused by all the important accidents involving passenger and goods trains.

181. The causes of these serious accidents and the casualties and damage resulting therefrom have been classified under certain broad heads in Annexures LXIV and LXV respectively. We would ordinarily have classified the causes under different groups in the annexures but with a view to compare the position with earlier years, the manner in which the figures of such accidents had been classified by the Kunzru Committee has been adopted.

182. It will be seen from Annexure LXIV that the total number of serious accidents increased from 74 in the five years from 1957 to 1962 to 79 in the five years 1963-64 to 1967-68. In both the five-year periods, however, the accidents attributable to the first four causes, namely, drivers disregarding signals or running at an excessive speed, station staff setting incorrect points or receiving/despaching trains onto blocked lines or sections, sabotage and collisions at level crossings were equal in number, namely 56. Their percentage to the total number of serious accidents in the two respective periods was 76 and 71 per cent.

183. A study of the 56 accidents during the years 1963-64 to 1967-68 reveals that:—

- (i) drivers caused 38 per cent of these either by disregarding signals or by running at excessive speeds or by violating other safety rules;
- (ii) station staff were responsible for 23 per cent of the accidents having caused these by incorrect setting of points or by receiving or despatching trains on blocked lines or sections;
- (iii) 30 per cent of these resulted from wilful tampering with track or other acts of sabotage; and
- (iv) 9 per cent were level crossing accidents for all of which road users were found to be responsible.

184. A comparison of serious accidents during the last five years with those of the preceding five years i.e., 1957 to 1962 has been made in the tables I and II in Annexure LXIV. Summarised, the position is as follows:—

TABLE 40

Broad Causes	1957—62	1963-64 to 1967-68
(i) Failure of drivers and station staff	40	34
(ii) Train wrecking	12	17
(iii) Accidents at level crossings due to :		
(a) failure of Railway staff	1	..
(b) failure of road users	3	5
(iv) Defects in rolling stock or locomotives	5	3
(v) Defects in track	4	3
(vi) Fires in trains	2	3
(vii) Miscellaneous causes	7	12
(viii) Causes not determined	Nil	2
Total	74	79

185. It is significant that the number of serious accidents due to failure of drivers and station staff decreased from 40 to 34 and those caused by defects in track, rolling stock, engines and fires in trains from 11 to 9, thereby registering a reduction of 15 per cent and 18 per cent respectively. Putting these together, the number of cases in which the responsibility can be laid on the railway administration or its staff, came down from 52 in the years 1957 to 1962 to 43 in the years 1963-64 to 1967-68.

186. It will also be seen from Annexure LXIV that the increase in the number of serious accidents was almost entirely due to a rise in the number of cases attributable to acts of sabotage, failures of road users and other miscellaneous causes like rash acts of outsiders, natural calamities, explosions and undetermined causes.

187. The increase in the number of accidents by tampering with track or other acts of sabotage is a continuance of the rising trend over the last 15 years which rose from 6 cases in the years 1952 to 1957, to 12 in the next 5 years and to 17 during the years 1963-64 to 1967-68, thus, registering an increase of 100 per cent and 42 per cent respectively during the last three quinquennia. This evidence of increasing lawlessness in our national life cannot but be viewed with disquiet.

188. Turning now to the analysis of casualties and damages, the position will be clear from Annexure LXV. It will be seen that the number of persons killed increased from 312 to 739. The reason for this large increase however, were the heavy casualties in three accidents for which the Railway Administration was not directly responsible. Of these, 2 were cases of sabotage near Furkating and at Lumding stations on the Northeast Frontier Railway in 1966 and one where the whole train was washed away by a tidal wave near Dhanushkodi in 1964. These 3 accidents accounted for 223 killed. Even excluding such cases, the figures of those killed in accidents, caused by failure of staff rose from 166 to 240.

189. The total number of persons injured in the serious accidents in the years 1957 to 1962 was 1802 whereas in the subsequent five years it rose to 2,271. This increase again was mainly on account of the injuries caused in explosions and accidents to trains near Furkating and at Lumding stations on the Northeast Frontier Railway due to sabotage.

190. There was also a large increase in damage to property in the years 1963-64 to 1967-68 when compared with the previous 5 years. The damage due to accidents attributable to failure of railway staff went up from Rs. 16.5 lakhs in the five years 1957 to 1962 to Rs. 51 lakhs in the five years 1963-64 to 1967-68.

191. In other words, while the number of accidents due to human failure came down from 40 to 34, the consequences of such accidents in the latter period were more serious both in the matter of loss of life and limb and in the matter of damage to property. While to an extent this may be fortuitous, it does emphasise the importance of finding ways and means of eliminating human failure.

CHAPTER IV

AN APPRECIATION OF THE RECOMMENDATIONS MADE BY THE KUNZRU COMMITTEE AND OF ACTION THEREON

192. As has been stated in paragraph 4 of Chapter I, the Committee were called upon by the first of their terms of reference, to review the recommendations made by the Kunzru Committee and their implementation. We have already in an earlier chapter made a statistical review of the railway accidents during the years since the Kunzru Committee submitted their report. To what extent the declining tendency in the incidence of accidents was a direct result of the implementation of the recommendations of the Kunzru Committee is indeed a matter on which it is difficult to make a precise assessment. Nonetheless, it is clear that the recommendations of the Kunzru Committee did make an impact in promoting safety in train operation on the Indian Railways during the last few years and in reinforcing the normal efforts made by the Administration over the years to bring down the incidence of accidents. The annual Review of Accidents published by the Railway Board recounts the measures taken by the Railway administration towards that end.

193. In the paragraphs which follow, we take under certain group heads, the more important of the recommendations made by the Kunzru Committee for the purpose of our review. So as to be able to render an appreciation of these recommendations and of the action taken on them, we have expressed wherever we considered it necessary and justified, our views on the recommendations as also on the action taken thereon as reported to us by the Railway Board. We may state here that our observations are based primarily on the information furnished to us by the Railway Board. Wherever the Committee had in its possession data relevant to the implementation of any of the recommendations gathered either from the Railway Administrations or from other sources, such data have been used to amplify our comments. As stated before, the comments in the paragraphs which follow in this Chapter are confined only to those recommendations which we consider were the most significant and to which we attach importance. The other observations of the Kunzru Committee which are factual in nature or suggestions which emphasize the observance of existing procedures and practices, we have refrained from commenting upon. These, however, we place in an appendix and against each of these we record the action taken as reported by the Railway Board. The remarks of the Railway Board on these are self explanatory and we do not add any comments thereon.

194. We may add that we may have occasion to refer back to some of the recommendations made by the Kunzru Committee when we attempt to make our suggestions and recommendations in Part II of our Report for further minimising railway accidents. It is also likely that in the light of our visits to the Railways, the R.D.S.O. and the production units, and discussions with senior Railway officers and others, it may be necessary to modify some of our observations contained in this Part of the Report; and we shall have no hesitation in doing so.

195. With these initial observations, we now go on to the review of recommendations of the Kunzru Committee and action taken on them.

196. For the purpose of our review, the observations and recommendations made by the Kunzru Committee have been put together under certain main heads indicated below:—

Staff,

Safety Organisation, Rules and other operating matters,

Permanent Way,

Level Crossings,

Signalling,

Rolling Stock,

Stores, post-accident relief measures and other matters.

197. Wherever the observations of the Kunzru Committee on any subject were contained in various parts of their Report, these have been reviewed together to avoid repetition.

198. In regard to the observations made by the Kunzru Committee concerning the Research, Designs and Standards Organisation, we have, on account of the special nature and obvious importance of the subject, placed our appraisal of the recommendations and the action taken on them in Chapter V of the Report instead of discussing them in this Chapter along with other recommendations. As for the Railway Inspectorate (now called the Commission of Railway Safety), we propose to deal with it separately in Part-II of our Report.

Staff

199. *Training Schools—capacity, utilisation, courses and manning:*—(Recommendations No. 52, 53, 54 and 55, Part-II)—The Kunzru Committee had observed that the training facilities on the Eastern Railway in case of class III transportation staff and on the Western Railway in the case of class IV staff were inadequate. They also found the capacity of the training school at Tiruchirapalli on the Southern Railway inadequate. On most of the Railways, the utilisation even of the then existing training facilities was found to be limited and unsatisfactory.

200. A survey of the training facilities and their utilisation for the various categories of staff during the years 1966-67 and 1967-68 is brought out in Annexure LXVI.

201. In regard to the capacity of the Zonal Training School on the Southern Railway on which the Kunzru Committee had remarked, the comments of the Railway Board and the information furnished by the Southern Railway do not indicate whether the capacity has been increased. The Southern Railway has not intimated the extent of utilisation of the existing training facilities beyond saying that every effort is being made to ensure that the school capacity is not wasted. These remarks are too general for us to make any appraisal.

202. It will also be seen from Annexure LXVI that the utilisation of capacity for permanent way class III staff is very low on the Eastern, the Northern, the North Eastern and the Northeast Frontier Railways. The percentage of utilisation of capacity has dropped on the Central, the Northern, the North Eastern and the South Eastern Railways, in case of class III operating staff, on the Central, the Northern, the Northeast Frontier Railways and to some extent on the Western Railway in case of loco running staff, on the Central and the North Eastern Railways in case of train examiners, etc. It is evident from the limited information available that the available capacities have been only partially utilised. We urge that factors which militate against the proper utilisation of training facilities should be located and remedied.

203. The Kunzru Committee had examined the training periods and disfavoured the reduction in the initial period of training on a few Railways. We have examined the duration of initial and refresher training, the periodicity of refresher courses for certain categories of staff and the educational qualifications prescribed for various categories. These details for the various Railways are given in Annexure LXVII.

204. It would appear that while the North Eastern, the Northeast Frontier, the South Eastern and the Western Railways have not laid down any educational qualifications in case of switchmen, the Central and the Southern Railways have prescribed 6th standard and the Eastern Railway 8th standard for them. The Northern Railway has laid down "under matric" which does not signify anything specific by way of standard of education.

205. It will also be seen that there is a wide disparity in the duration of initial and refresher training on the different Railways for certain categories of staff. The range of this disparity is shown below:—

TABLE 41

Category of staff	Duration of Initial Training		Duration of Refresher Training	
	Minimum	Maximum	Minimum	Maximum
(i) S. Ms and A.S. Ms	7 months	14 months	3 weeks	1½ months
(ii) Switchmen	15 days	4 months	10 days	1 month
(iii) Cabinmen	..	..	10 days	3 weeks
(iv) Guards	21 days	12 weeks	15 days	1 month
(v) Drivers	4 weeks	3 month	3 weeks	5 weeks
(vi) Train Examiners	4 years	5 years	2 weeks	1 month
(vii) PWIs and APWIs	7½ months	1½ years	15 working days	2 months
(a) Diploma holders	3 months on South Eastern	3 years		
(b) Matriculates.	7 months			

206. We are unable to appreciate the wide variations in the duration of the courses. We feel that working conditions on all Railways are more or less the same and the nature of duties of the various categories of staff do not differ very much on the different Railways. We would therefore suggest that a uniform practice in this regard may be adopted taking into account the requirements of the average employee in each category.

207. With the increasing introduction of modern signalling techniques on the Railways, the maintainers who have actually to maintain the sophisticated gadgets have to play a vital role in ensuring safety of operations. We consider that certain minimum educational qualifications and the duration and nature of training to meet the job requirements should be prescribed for them. Here too, at present, there is no uniformity on the different Railways. For example, the Eastern Railway had prescribed 8th standard while the Northeast Frontier and the Southern Railways have laid down matriculation standard as the minimum educational qualifications. Some Railways have not laid down anything. The frequency of refresher training for them also needs to be specified.

208. It is necessary that the training of staff should be examined in all its aspects, streamlined and rationalised.

209. *Instructors*:—The Kunzru Committee recommended that the Instructors for the training schools should be selected by a Selection Committee after undergoing a test devised to assess their capacity and aptitude for teaching and thereafter should undergo a teachers' training course in an Institute. The Kunzru Committee further suggested that the services of experienced Instructors should be utilised beyond 58 years, if physically fit. The Railway Board accepted these recommendations.

210. We found in one of the training schools that many Instructors were those who had been selected on *ad hoc* basis. We were further informed that many of them were "rejects" from the line. Some of the Instructors in the school were reported to be there for more than a decade. We consider these aspects unhealthy and suggest that only persons with an outstanding record of work to their credit on the open line should find their way into the school as Instructors so that they can make an impression upon the pupils whom they have to guide and instruct. Their tenure should be 3 to 5 years so that the training in the schools is not divorced from practical working on the line.

211. *Heads of Zonal Schools*:—The Kunzru Committee observed that it was essential that the heads of Railway Zonal Training Schools should be selected with care and discrimination and should remain at their posts for not less than three years. The Railway Board accepted this recommendation. Some instances, however, came to our notice in which the heads had been transferred in shorter periods. We presume these transfers took place in the larger interest of public service and that generally speaking the interests of training of staff are kept in view by the Railways.

212. *Refresher Courses*:—[Recommendations 37, 38 (Part I) & 109 (Part II)]—The Kunzru Committee had observed that the training of an employee should be a continual process. The employee should go back to the training school to refresh his theoretical knowledge, to get new ideas and learn new techniques, to compare what is being done on the line with what should be done and to get his doubts and misunderstandings clarified from the instructors.

213. With this end in view, the Kunzru Committee surveyed the position in respect of refresher training given to station masters and assistant station masters, levermen, cabinmen, switchmen and drivers. They found that the percentage of staff in the categories of station masters and assistant station masters, levermen, cabinmen, switchmen and drivers, who actually

attended refresher courses was low and that a large number of staff were overdue refresher courses. The Railways attributed this state of affairs to inadequate relief arrangements or shortage of instructors or to staff being reluctant to go for training. The Kunzru Committee recommended that special steps should be taken to see that such courses should be imparted at least once in five years to the operating categories of staff and during these refresher courses emphasis should be laid on safety aspects of working.

214. The Kunzru Committee had also observed that Permanent Way Inspectors and Assistant Permanent Way Inspectors were getting practically no refresher courses except on the North Eastern and the Western Railways. They had suggested that steps should be taken to ensure that these categories received refresher training regularly. They also considered it necessary for the gangmates to have refresher courses at regular intervals in view of the varying conditions of traffic and track.

215. The Railway Board observed that the frequency of refresher courses once in 5 years and the safety orientation of refresher training was already the accepted policy. They added that the matter had been examined and steps for imparting of effective and regular refresher training to staff had been indicated to the Railways.

216. We understand that, apart from the categories referred to above, the Board issued instructions for giving refresher courses to shunters and firemen, train examiners and signal and telecommunication inspectors also.

217. The Railways were asked to indicate the position in respect of refresher training imparted to the different categories of staff during the years 1966-67 and 1967-68. The percentage of shortfall as between the staff who were due to attend the refresher courses on 1-4-66 and 1-4-67 and who actually attended during the years ending 31-3-1967 and 31-3-1968 respectively is shown for the different Railways in Annexure LXVIII.

218. It will be seen that despite the action taken by the Railway Board as far back as 1963, the shortfall in the refresher training of staff on some of the Railways was substantial even in the categories of staff referred to by the Kunzru Committee, *viz.*, station masters and assistant station masters, switchmen, cabinmen, levermen, pointsmen, drivers, permanent way inspectors and assistant permanent way inspectors and gangmates. In some categories, the shortfall on certain Railways exceeded 80 per cent. The position was also not happy in the case of refresher courses for shunters and firemen, train examiners, signal and telecommunication inspectors and assistant inspectors, i.e., the categories of staff for which refresher training was ordered by the Board as far back as 1955.

219. It would also appear that while some of the Railways are imparting refresher training to certain categories of staff, namely, shunters, assistant drivers and firemen, carriage and wagon fitters, keymen, block signal, electric signal and mechanical signal maintainers, others are not doing so. There is, thus, no uniformity in the practice of giving refresher courses to certain categories of staff.

220. Some of the Railways like the North Eastern, the Northeast Frontier, the Southern, the South Central, the South Eastern have attributed the backlog to inadequacy of leave reserve or inadequacy or absence of trainee reserve posts. We deal with this later in this Chapter.

221. It goes without saying that the categories of staff in need of refresher training should be given such training on all Railways without any exception. We think that much remains to be done if the backlog in refresher training is to be cleared and the recommendation of the Kunzru Committee effectively implemented.

222. *Shortage of Staff:*—[Recommendations Nos. 43(i), 44-Part-I, No. 47-Part-II]—The Kunzru Committee had observed that there were continuous shortages in the categories of station masters and assistant station masters, cabinmen, levermen, drivers and other operating categories. They had asked for special efforts to be made for filling up these vacancies. They further suggested that in view of the continuing shortage in the cadres, staff in operating categories like drivers, station masters, cabinmen, levermen, etc., should be given extension of service.

223. The Railway Board in their comments observed that the age of compulsory retirement had been raised to 58 years with effect from 1-12-1962. The latest orders issued on 1-3-1968 regarding the grant of extension of service beyond the age of 58 years are that (i) no proposal for extension beyond the age of superannuation should ordinarily be considered, (ii) extension may be given only in very exceptional circumstances and in any event not beyond the age of 60 years in respect of non-technical/non-scientific posts and not beyond the age of 62 in the case of technical/scientific personnel. According to the Railway Board, shortages in cadres are also being progressively eliminated.

224. We have examined the existing shortages in the various categories of staff on the different Railways over the past three years. The position on the different Railways in case of various cadres of staff has been shown in the succeeding paragraphs. In the case of South Central Railway, the position as it existed on 31.3.1966 on the portions which later on (on 2-10-1966) went to form the Railway has been shown.

225. *Station Masters:*—The position over the past three years was as follows:—

TABLE 42

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage
Central	528	6	1.1	560	7	1.2	553	6	1.0
Eastern	471	23	5.0	481	9	1.9	486	13	2.8
Northern	947	1	0.1	948	..	..	958	..	..
North Eastern	561	16	3.0	560	8	1.4	578	5	0.9
Northeast Frontier	572	23	4.0	581	22	4.0	585	25	4.0
Southern	856	3	0.3	831	..	..	831	8	1.0
South Central	615	6	0.9	624	2	0.4	632	15	2.4
South Eastern	609	..	..	603	..	..	620	..	..
Western	990	..	..	993	..	..	988	..	..
All Railways	6,149	78	1.26	6,181	48	0.77	6,231	72	1.1

226. It will be seen that the overall shortage on 31-3-1968 increased when compared to that which existed on 31-3-1967. Of the 72 vacancies on all Railways on 31-3-1968, more than one-third existed on Northeast Frontier Railway. The shortages on the Eastern, the Northeast Frontier and the South Central Railways, exceed the average of 1.1 per cent as on 31-3-1968. It is to be noted that the vacancies of station masters are to be filled in by promoting assistant station masters and not by direct recruitment.

227. *Assistant Station Masters:*—The position during the last 3 years was as follows:—

TABLE 43

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage
Central . . .	2,388	16	0.7	2,319	23	0.9	2,507	18	0.7
Eastern . . .	2,539	28	1.1	2,518	28	1.1	2,519	10	0.4
Northern . . .	3,656	141	3.9	3,725	69	1.8	3,589	74	2.0
North Eastern . .	1,563	47	3.0	1,580	10	0.6	1,618	4	0.3
Northeast Fron- tier . . .	1,530	17	1.1	1,553	56	3.6	1,534	17	1.1
Southern . . .	3,247	26	0.8	3,200	79	2.5	3,195	140	4.4
South Central . .	2,158	41	1.8	2,192	25	1.2	2,212	32	1.4
South Eastern . .	2,400	22	0.9	2,459	34	1.3	2,465	..	..
Western . . .	3,102	18	0.5	3,123	13	0.3	3,182	35	0.8
All Railways . .	22,583	356	1.6	22,669	337	1.4	22,821	330	1.4

228. It would be observed that the shortage on the Southern Railway has been increasing from year to year; the shortage as on 31-3-1968 was well above the average. There was a slight increase in the shortage on the Northern, the South Central and the Western Railways during 1967-68 as compared to the previous year. Of the 330 vacancies on all Railways on 31-3-1968, 140 were on the Southern Railway and 74 on the Northern Railway. The Kunzru Committee had observed that the most glaring shortages in the categories of station masters and assistant station masters were on the Southern and the Northeast Frontier Railways. It is, however, reassuring that the shortage in the categories of station masters and the assistant station masters which stood at 4.9 per cent on 31-3-1962 came down to 1.4 per cent on 31-3-1968 indicating considerable improvement.

229. *Switchmen*:—In the cadre of switchmen, there were only 22 vacancies against a strength of 5,197 on 31.3.1968. The shortage was thus negligible.

230. *Cabinmen*:—The position during the last 3 years was as follows:—

TABLE 44

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage
Central	242		..	713	2	0.3	876	1	0.1
Eastern	425	52	12.2	529	..	..	567	..	..
Northern	1,743	8	0.45	1,773	8	0.4	1,960	5	0.2
North Eastern	710	2	0.2	763	10	1.4	764	8	1.0
Northeast Frontier	626	67	10.0	833	4	0.5	814	20	2.1
Southern	1,619	15	0.9	1,689	2	0.1	1,585	40	2.5
South Central	861	74	8.6	782	27	3.5	1,118	16	1.4
South Eastern	354	..	..	289	..	..	474	10	2.0
Western	303	..	..	531	87	16.0	538	61	11.0
All Railways	6,883	218	3.2	7,902	140	1.8	8,696	161	1.8

231. The shortage in the category was particularly pronounced on the Western Railway. Even on the Northeast Frontier, the Southern and the South Eastern Railways the shortage increased during 1967-68 as compared to the previous year. It may be remarked that the shortage of cabinmen on 1-5-1963 on all Railways as noted by the Kunzru Committee was only 19. It is evident that this gap has considerably widened.

232. *Levermen and Pointsmen*:—The position over the past 3 years was as follows:—

TABLE 45

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage	Sanctioned strength	Vacancies	Percentage
Central	8,682	68	0.8	8,517	296	3.5	8,235	143	1.7
Eastern	3,190	213	6.6	3,216	54	1.5	3,037	4	0.13
Northern	5,185	103	1.9	5,126	112	2.2	4,908	27	0.55
North Eastern	2,992	60	2.0	3,035	41	1.3	2,971	23	0.78
Northeast Frontier	3,183	159	5.0	3,170	70	2.5	3,247	26	0.8
Southern	4,501	69	1.5	4,201	32	0.75	4,172	834	20.0
South Central	4,758	60	1.3	4,615	71	1.5	4,341	163	3.7
South Eastern	5,092	46	0.9	4,289	..	..	5,010	..	..
Western	7,586	51	0.7	7,386	33	0.45	7,337	69	0.94
All Railways	45,169	829	1.8	43,555	709	1.6	43,258	1,269	2.9

233. In this category the extent of shortage increased in 1967-68 as compared to previous years; it was 1.8 per cent on 31st March, 1966, 1.6 per cent on 31st March, 1967 and 2.9 per cent on 31st March, 1968. The position on the Southern Railway as on 31-3-1968 was very unsatisfactory. The Kunzru Committee had also found the position unsatisfactory on the Southern Railway in the category of levermen.

234. *Shunting Jamadars, Gunners, Shunting Masters and Shuntmen:—* The position over the past 3 years was as follows:—

TABLE 46

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cent tage
Central . . .	343	9	2.6	356	13	3.6	355	13	3.6
Eastern . . .	4,067	209	5.1	4,004	274	6.8	3,813	133	3.2
Northern . . .	3,567	125	3.4	3,573	105	2.9	3,608	37	1.0
North Eastern . . .	502	11	2.2	508	18	5.8	524	19	3.6
Northeast Fron- tier . . .	885	23	2.6	860	36	4.1	853	48	5.6
Southern . . .	738	6	0.8	721	10	1.3	707	12	1.7
South Central . . .	552	18	3.2	571	33	5.8	1,333	21	1.5
South Eastern . . .	1,894	14	0.74	1,891	11	0.58	1,854	13	0.7
Western . . .	479	1	0.2	484	7	1.04	479	6	1.2
All Railways . . .	13,027	416	3.1	12,968	507	3.9	13,526	302	2.2

235. The shortages have been increasing from year to year on the Northeast Frontier Railway. The shortages on the Central, the Eastern, the North Eastern and the Northeast Frontier Railways in 1967-68, were more than the average for all Railways.

236. *Guards:—* The position over the past 3 years was as follows:—

TABLE 47

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cent- age	Sanc- tioned stren- gth	Vacan- cies	Per- cent tage
Central . . .	1,621	2	0.1	1,652	17	1.0	1,960	15	0.8
Eastern . . .	1,471	19	1.3	1,471	30	2.0	1,477	13	0.8
Northern . . .	1,525	68	4.4	1,563	88	5.6	1,573	50	3.1
North Eastern . . .	773	13	1.7	787	15	2.0	790	6	0.8
Northeast Fron- tier . . .	742	121	6.3	740	78	10.5	741	7	0.9
Southern . . .	855	..	..	812	3	0.4	809	7	0.9
South Central . . .	983	18	1.8	1,060	35	3.3	1,053	15	1.4
South Eastern . . .	1,908	32	1.7	1,954	19	1.0	1,979	44	2.0
Western . . .	1,256	18	1.4	1,281	20	1.6	1,436	11	0.8
All Railways . . .	11,134	291	2.6	11,320	305	2.6	11,818	168	1.4

237. In this category, the shortages have been decreasing from year to year over the past 3 years. The Northeast Frontier Railway was able to wipe out the extent of shortage noticeably by the end of March, 1968. The position on the Northern Railway shows consistent shortage throughout these years.

238. *Drivers*:—The position over the past 3 years was as follows:—

TABLE 48

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage
Central	2,133	70	3.1	2,071	70	3.3	2,143	126	5.8
Eastern	2,070	62	3.0	2,107	104	4.9	2,235	141	6.3
Northern	2,722	17	0.6	2,704	12	0.45	2,741	19	0.69
North Eastern	1,360	69	5.0	1,362	61	4.5	1,368	55	4.0
Northeast Fron- tier	1,084	40	3.7	1,051	15	1.4	1,030	23	2.2
Southern	1,593	24	1.5	1,605	37	2.3	1,611	57	3.5
South Central	1,441	45	3.1	1,430	38	2.6	1,452	73	5.0
South Eastern	2,476	26	1.0	2,171	16	0.7	2,144	13	0.6
Western	2,190	68	3.1	2,274	53	2.3	2,214	12	0.6
All Railways	17,069	421	2.5	16,775	406	2.4	16,938	519	3.0

239. The overall shortage, it would be observed, has increased over the three years. It was 3 per cent on 31-3-1968 compared to 2.4 per cent on 31-3-1967 and 2.5 per cent on 31-3-1966. The shortage has been increasing on the Central, the Eastern and the Southern Railways. Here it may be observed that the overall shortage of drivers on 1-5-1968 was only 41 as noted by the Kunzru Committee. The corresponding shortage of 519 on 31-3-1968 is therefore a matter of concern.

240. *Firemen*:—The position over the past 3 years was as follows:—

TABLE 49

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage
Central	5,007	133	2.6	4,951	49	0.9	4,788	44	0.9
Eastern	5,204	130	2.5	5,096	76	1.4	5,038	48	0.9
Northern	7,571	209	2.7	7,379	76	1.0	7,508	89	1.0
North Eastern	2,993	105	3.5	2,947	140	4.8	2,927	132	4.5
Northeast Fron- tier	2,277	73	3.2	2,222	47	2.1	2,128	35	1.6
Southern	3,919	18	0.46	3,964	58	1.5	3,504	93	2.6
South Central	3,561	187	4.9	3,613	53	1.4	3,037	168	4.6
South Eastern	2,793	22	0.78	2,403	..	..	2,436	5	0.2
Western	5,478	84	1.5	5,438	110	2.0	5,343	100	1.9
All Railways	38,803	961	2.5	38,013	609	1.6	37,309	714	1.9

241. The shortage has been increasing from year to year on the Southern Railway. On the North Eastern and the South Central Railways, the extent of shortage on 31-3-68 was well above the average for all Railways.

242. *Assistant Drivers*:—Assistant drivers run on diesel and electric engines in place of firemen. The position in their case over the past 3 years was as follows:—

TABLE 50

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage
Central . . .	307	27	8.7	343	33	9.6	435	9	2.06
Eastern . . .	411	6	1.5	531	2	0.4	576	6	1.04
Northern . . .	144	..	..	208	..	..	207	..	..
Northeast Fron- tier . . .	186	..	..	198	..	..	198	..	..
Southern . . .	129	..	..	129	..	..	155	3	1.9
South Central . . .	..	..	..	92	9	10.0	88	..	..
South Eastern . . .	295	22	7.0	615	106	17.0	755	134	17.8
Western . . .	108	..	..	142	..	..	155	..	..
All Railways . .	1,580	55	3.5	2,258	150	6.6	2,569	152	5.9

243. It will be seen that the position on the South Eastern Railway has been deteriorating over the past 3 years and the shortage on 31-3-1968 stood at 17.8 per cent which is inordinately high. The Central Railway has been able to bring down the shortage considerably.

244. *Permanent Way and Assistant Permanent Way Inspectors*:—The position over the past 3 years was as follows:—

TABLE 51

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage	Sanc- tioned stren- gth	Vacan- cies	Per- cen- tage
Central . . .	231	4	1.7	249	2	0.8	250	3	1.2
Eastern . . .	155	..	..	216	..	..	237	..	..
Northern . . .	300	4	1.3	303	3	1.0	315	4	1.2
North Eastern Northeast Frontier . . .	223	24	10.8	208	24	11.5	227	19	8.9
Southern . . .	92	2	2.0	110	2	1.8	109	..	..
South Central . . .	348	13	4.0	333	9	2.7	333	8	2.4
South Eastern . . .	231	4	2.0	230	5	2.0	242	..	..
Western . . .	347	4	1.0	353	..	..	359	..	..
All Railways . .	417	..	..	410	6	1.5	437	6	1.4
All Railways . .	2,344	55	2.3	2,412	51	2.9	2,509	40	1.9

245. The shortage on the North Eastern Railway was unduly heavy during all the three years. In fact, nearly half of the overall shortage on all Railways taken together was accounted for by this Railway alone.

246. *Train Examiners*:—The position over the past 3 years was as follows:—

TABLE 52

Railway	As on 31-3-1966			As on 31-3-1967			As on 31-3-1968		
	Sanc- tioned strength	Vacan- cies	Per- cen- tage	Sanc- tioned strength	Vacan- cies	Per- cen- tage	Sanc- tioned strength	Vacan- cies	Per- centage
Central ..	802	9	1.1	804	12	1.49	803	17	2.1
Eastern ..	991	5	0.5	985	9	0.9	982	..	..
Northern ..	661	18	2.7	667	7	1.0	672	5	0.7
North Eastern	230	19	8.1	252	10	5.7	242	34	14.0
Northeast Frontier	327	18	5.0	330	18	5.5	339	18	5.0
Southern ..	440	4	0.9	423	3	0.7	424	10	2.4
South Central	326	5	1.5	367	3	0.8	389	17	4.3
South Eastern	687	2	0.29	715	10	1.3	714	2	0.28
Western ..	577	3	0.5	583	2	0.3	589	9	1.5
All Railways	5,041	83	1.6	5,120	74	1.4	5,154	112	2.1

247. The shortage on the North Eastern Railway on 31-3-1968 was not only heavy but had substantially increased as compared to the previous year. The shortages on the Northeast Frontier and the South Central Railways too were well above the average for all Railways. On the Central Railway, the shortage has been increasing from year to year.

248. Overall, the extent of shortages in the various categories on 31-3-1968 ranged between 1.4 and 3 per cent except in the category of assistant drivers where the shortage was to the extent of 5.9 per cent. Over individual Railways, in some categories, the shortages have been glaring but by and large the extent of shortage has been diminishing. We urge that this matter should continue to receive the urgent attention of the Railway Administrations as shortages in cadres have the effect of making the staff work overtime, and by depleting the leave reserves, reducing their chances of getting leave etc. This is not conducive to safety in train operation and the need for wiping out these shortages cannot be overemphasised.

249. *Leave Reserves*:—[Recommendations 43(ii)—Part I and 51(i), (ii) (iii) & (iv)—Part II]—Having gone into the question of leave reserves in detail and taken note of the representations about the inadequacy of leave reserves, the Kunzru Committee had recommended that leave reserves should not only be adequate but should also be a little on the liberal side so that the staff can be sent more frequently for refresher courses, seminars, etc. They further observed that there should not be any glaring disparity in the

leave reserve provided for Class III and Class IV staff respectively and that the leave reserve should be provided to the maximum extent possible separately for each category. They suggested that the headquarters of the leave reserve should be decentralised and control over their movements entrusted to the senior subordinates in charge as far as feasible.

250. The Railway Board, in their comments, while conceding that the leave reserves were intended to cover absence not only due to leave but also due to other purposes, *e.g.*, training courses, vision tests, joining time on transfer, etc., stated that the Railway Administrations had been empowered under extent orders to create separate trainee reserve posts in addition to normal leave reserve provision, to cover periods of training and refresher courses and directed to make every effort to liquidate the backlog in refresher courses, where prescribed. The Railways were permitted to refix the leave reserve within the maximum limit prescribed according to actual requirements. They further stated that there had been an upward revision in the maximum prescribed in case of running staff and that leave reserves for Class IV staff were refixed at the same percentage as prescribed for the corresponding groups of Class III staff. The Railway Board explained that the leave reserves were basically provided in the lowest category in each promotional group so that an employee could rise higher and higher from the lowest rung but where warranted by operational necessity, a departure from the norm is made and the leave reserve provided in the intermediate grade or in the category itself on the merits of each case. The Railway Administrations had also been advised to review the headquarters of the leave reserves so as to afford their quick availability with the minimum dislocation for the leave reserve themselves.

251. In reply to the questionnaire sent to the Railways, a number of Railways brought it to our notice that according to Railway Board's directive of 4-2-1967, the leave reserves as actually obtaining on that date had been frozen at that level for reasons of economy and that for several categories the actual leave reserves were inadequate.

252. The Railway Board, however, further indicated that on a point having been raised by representatives of labour, the Railway Administrations were asked about the position of leave reserves. The information furnished by the Railways indicated that on almost all the Railways, the percentages of leave reserves in operation on 4-2-1967, the date on which they were frozen, for a number of categories were lower than the minimum percentages prescribed by the Railway Board. The Board stated that the Railway Administrations had been accordingly asked to examine the adequacy or otherwise of leave reserves and approach the Board with their recommendations wherever the leave reserve strength was found to be inadequate and that the question would be further examined.

253. We have examined the position in respect of leave reserves prescribed for the various categories of staff, those actually adopted and operated by the Railways when they were frozen and the incidence of absenteeism, etc. The 'adopted' leave reserve is the percentage of leave reserve fixed by a Railway which needs to be provided for a category of staff, and the 'operated' leave reserve is the percentage of leave reserve actually provided for that category. The results of this examination are contained in the succeeding paragraphs.

254. *Station Masters and Assistant Station Masters*:—The result of the examination is as follows:—

TABLE 53

Railway	Percentage of leave reserve prescribed by Railway Board		Percentage of leave reserve on Railway		Average number of absentees during peak periods	
	Minimum	Maximum	Adopted	Operated	1966-67	1967-68
Central	16½ per cent	30 per cent	18·0	18·0	737	494
Eastern			24·0	24·0	348	346
Northern			25·0	12·8	904	870
North Eastern			28·5	26·0	281	323
Northeast Frontier			27·0	27·0	466	468
Southern			20·0	20·0	1,010	888
			to	to		
			25·0	25·0		
South Central			19·3	20·0	340	873
South Eastern			28·0	28·0	98	100
Western			30·0	25·7	1,038	1,163

Railway	Total number of instances SMs & ASMs working overtime		Average spell of overtime	
	1966-67	1967-68	1966-67	1967-68
			H-M	H-M
Central	47,529	41,242	4-14	6-03
Eastern	1,995	2,120	5-36	5-42
Northern	73,005	90,648	11-36	12-18
North Eastern	17,419	12,135	4-0	3-24
Northeast Frontier	2,387	2,228	20-30	17-30
Southern	22,151	20,186	26-00	24-30
South Central	10,339	12,349	3-30	3-30
South Eastern	4,064	4,520	3-00	3-00
Western	84,452	89,861	No information.	

255. It will be seen that the percentage of leave reserve operated by the Northern Railway is only 12·8 per cent i.e. even less than the minimum. If we take into account the shortages in the strength of station masters and assistant station masters, the position gets further aggravated. Curiously, the Northern Railway had stated in reply to the questionnaire that their leave reserve was adequate; and yet this Railway had the largest number of instances of SMs and ASMs working overtime during 1967-68 and the second largest number of such instances in 1966-67 also. On the Western Railway, the incidence of SMs and ASMs working overtime was very high during these years even though their operative leave reserve percentage is 25·7. The average spell of overtime was high on the Southern and the Northeast Frontier Railways and showed an increase on the Central and the Northern Railways.

256. *Switchmen*:—The position is as follows:—

TABLE 54

Railways	Percentage of leave reserves prescribed by the Railway Board		Percentage of leave reserve on Railway		Average number of absentees during peak periods	
	Minimum	Maximum	Adopted	Operated	1966-67	1967-68
Central	16½ per cent	30 per cent	14.0	14.0	12	14
Eastern			17.2	17.2	284	286
Northern			25.0	2.8	222	235
North Eastern ..			20.0	20.0	10	12
Southern			10 to 15	10 to 15	48	51
South Central ..			14.9	15.0	..	2
South Eastern ..			25	25	32	34
Western			18	17.2	256	315

Railways	Total number of instances of switchmen working overtime		Average spell of overtime	
	1966-67	1967-68	1966-67	1967-68
			H-M	H-M
Central	395	506	9.37	8.7
Eastern	958	1,047	6.30	6.30
Northern	5,164	5,243	11.48	13.42
North Eastern ..	12	13	1.00	1.8
Southern	1,147	1,692	3.0	3.0
South Central ..	204	380	3.25	3.30
South Eastern ..	1,565	1,236	3.0	3.0
Western	12,416	11,757	No information.	

257. The number of instances of switchmen working overtime was the highest on the Western Railway and the second highest on the Northern Railway. The leave reserve operated on the Northern Railway was only 2.8 per cent. On most of the Railways the incidence of overtime working shows an increase during 1967-68 as compared to the previous year. The average spell of overtime was high on the Northern, the Central and the Eastern Railways during both the years.

258. *Cabinmen, Levermen, Pointsmen*—The result of the examination is as follows:—

TABLE 55

Railway	Percentage of leave reserve prescribed by the Railway Board		Percentage of leave reserve on the Railway		Average number of absentees during peak periods	
	Minimum	Maximum	Adopted	Operated	1966-67	1967-68
Central	16½ per cent	30 per cent	12.2	12.2	1,734	1,468
Eastern			19.6	19.6	484	492
Northern			25.0	11.3	1,297	1,239
North Eastern ..			18.5	18.0	456	511
			to	to		
Northeast Frontier ..	16½ per cent	30 per cent	20.0	20.0		
Southern			13.4	13.4	956	1,140
South Central ..			15.0	15.0	1,204	951
South Eastern ..			14.7	15.0	574	1,553
	16½ per cent	30 per cent	25.0	25.0	142	149
Western			18.0	Cabinmen 0.2	1,553	1,633
				Levermen 5.7		
				Pointsmen 1.3		

Railway	Total number of instances of cabinmen, levermen, pointsmen working overtime		Average spell of overtime	
	1966-67	1967-68	1966-67	1967-68
			H-M	H-M
Central	1,31,173	1,21,388	4.16	4.23
Eastern	1,823	2,154	5.18	6.12
Northern	34,462	29,945	14.00	14.29
North Eastern ..	12,671	14,575	3.00	3.00
Northeast Frontier ..	3,354	2,480	20.30	19.00
Southern	15,644	12,768	21.00	19.20
South Central ..	12,988	29,311	5.45	5.45
South Eastern ..	2,459	2,342	3.00	3.00
Western	36,119	34,870	No information.	

259. It will be seen that the percentage of leave reserve operated on the Western Railway has been only 0.2 per cent in case of cabinmen, 5.7 per cent for levermen and 1.3 per cent for pointsmen against 18 per cent adopted by the Railway, the minimum prescribed by the Railway Board being 16½ per cent. The Western Railway advised us that since due to the ban of 4-2-1967, they were unable to create leave reserve posts, they had approached the Railway Board thrice for permission to operate the leave reserves upto the percentage adopted by the Railway. But nothing appears to have come out of this so far and the leave reserves have stood at the inconceivably low level. The percentage of leave reserves operated on the Central, the Northern, the North Eastern (in case of pointsmen only), the Northeast Frontier, the Southern and the South Central Railways also falls short of the minimum percentage prescribed by the Railway Board. The number of instances of cabinmen, levermen and pointsmen working overtime was extremely high on the Central Railway and fairly high on the Western and the Northern Railways. The average spell of overtime on the Southern, the Northeast Frontier and the Northern Railways was considerable.

260. The percentages of leave reserves prescribed by the Railway Board, adopted and operated by the Railways in case of certain other categories of staff are brought out in the following table:—

TABLE 56

Percentages of leave reserves			Categories of staff			
			Guards	Shunt- ing staff	Drivers	Firemen/ Shunters, Asstt. Drivers
1. Prescribed by Railway Board	..	Min.	15.0	16½	15.0	15.0
		Max.	25.0	30.0	25.0	25.0
2. Central Railway	..	A	16.5	16.6	16.5	16.5
		O	15.5	16.6	12.9	13.4
3. Eastern Railway	..	A	17.7	20.6	15.0	20.0/12.4
		O	17.7	20.6	15.0	20.0/12.4
4. Northern Railway	..	A	20.0	..	20.0	25.0
		O	8.3	3.6	4.7	9.9
5. North Eastern Railway	..	A	20.0	17.7	20.0	20.0
		O	20.0	17.7	20.0	20.0
6. Northeast Frontier Railway	..	A	20.0	19.5	25.0	21.0
		O	20.0	19.5	25.0	21.0
7. Southern Railway	..	A	14.0 to	15.0	20.0	20.0
		O	20.0	..	..	..
		O	14.0 to	15.0	20.0	20.0
8. South Central Railway	..	A	25.0	20.0	20.0	20.0
		O	25.0	20.0	20.0	20.0
9. South Eastern Railway	..	A	20.0	..	25.0	25.0
		O	20.0	..	25.0	25.0
10. Western Railway	..	A	20.0	12.0	22.5	22.5
		O	14.16	12.0	8.4	20.0

Percentages of leave reserves			Categories of staff		
			Motormen	PWIs and APWIs	Train Exa- miners
1. Prescribed by Railway Board	..	Min.	15.0	15.0	16½
		Max.	25.0	25.0	30.0
2. Central Railway..	..	A	16.3	17.0	13.0
		O	16.3	15.5	13.0
3. Eastern Railway	..	A	15.0	No information	No information
		O	15.0		
4. Northern Railway	..	A	..	12.5	15.0
		O	..	12.5	15.0
5. North Eastern Railway	..	A	..	12.5 to	12.5 to
		O	..	13.5	30.0
		O	..	12.5 to	12.5 to
		O	..	13.5	30.0
6. Northeast Frontier Railway	..	A	..	No information	No information
		O	..	—Do—	—Do—
7. Southern Railway	..	A	20.0	No information	No information
		O	20.0	—Do—	—Do—
8. South Central Railway	..	A	..	8.7 to	11.0 to
		O	..	18.0	12.5
		O	..	8.7 to	11.0 to
		O	..	18.0	12.5
9. South Eastern Railway	..	A	..	18.0	10.0 to
		O	..	10.0 to	15.0
		O	..	15.0	10.0 to
		O	..	..	15.0
10. Western Railway	..	A	20.0	22.0	19.0
		O	20.0	2.5 PWIs	13.7
		O	..	20.9 APWIs	..

Percentages of leave reserves				Categories of staff		
				Motormen	PWIs and APWIs	Train Exa- miners
1. Prescribed by Railway Board	..	Min.	15.0	15.0	16½	16½
		Max.	25.0	25.0	30.0	30.0
2. Central Railway..	..	A	16.3	17.0	13.0	13.0
		O	16.3	15.5	13.0	13.0
3. Eastern Railway	..	A	15.0	No information	No information	No information
		O	15.0			
4. Northern Railway	..	A	..	12.5	15.0	15.0
		O	..	12.5	15.0	15.0
5. North Eastern Railway	..	A	..	12.5 to	12.5 to	12.5 to
		O	..	13.5	30.0	30.0
		O	..	12.5 to	12.5 to	12.5 to
		O	..	13.5	30.0	30.0
6. Northeast Frontier Railway	..	A	..	No information	No information	No information
		O	..	—Do—	—Do—	—Do—
7. Southern Railway	..	A	20.0	No information	No information	No information
		O	20.0	—Do—	—Do—	—Do—
8. South Central Railway	..	A	..	8.7 to	11.0 to	11.0 to
		O	..	18.0	12.5	12.5
		O	..	8.7 to	11.0 to	11.0 to
9. South Eastern Railway	..	A	..	18.0	12.5	12.5
		O	..	18.0	10.0 to	10.0 to
		O	..	10.0 to	15.0	15.0
		O	..	15.0	10.0 to	10.0 to
		O	..	..	15.0	15.0
10. Western Railway	..	A	20.0	22.0	19.0	19.0
		O	20.0	2.5 PWIs	13.7	13.7
		O	..	20.9 APWIs

A—Adopted

O—Operated

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261. It would appear that Northern Railway has been operating percentages lower than the minimum prescribed by the Board in case of almost all categories of staff. Other Railways also have reserves less than the minimum prescribed by the Railway Board for certain categories, e.g., the Central and the Western Railways in case of drivers and train examiners, the North Eastern Railway in case of P.W.Is and A.P.W.Is, etc.

262. It goes without saying that under normal conditions the staff should, on the one hand, be able to get the leave required by them and on the other, should not be made to work in excess of the prescribed hours of duty. Shortages in the sanctioned strength and inadequacy of leave reserves obviously militate against both these objectives and tend to create resentment in the minds of staff. Such a situation is hardly conducive to safety in train operation. The overtime working by a few categories of staff examined by us leaves no doubt in our mind that the incidence of overtime working is too heavy to be ignored. We feel that the measures necessary to curb overtime working by staff have not received the attention they deserved in spite of the great stress laid on this subject by the Kunzru Committee. We are also unable to appreciate fully the object of clamping down the leave reserves at the level obtaining on 4.2.1967 notwithstanding its inadequacy as the directive of the Railway Board of that date sought to do. We strongly recommend that the question of overtime working and leave reserves should be examined early and leave reserves on each Railway reviewed so that they reduce the incidence of excessive hours of work to the minimum and ensure that the requirements of leave, training, transfers, promotions, periodical medical tests, sports and other welfare activities, etc., are met with to a liberal extent. We see no conceivable reason why the minimum limits of leave reserves fixed by the Railway Board itself should not be immediately implemented.

263. *Hours of duty of running staff*:--[Recommendation No. 42—Part I]—The Kunzru Committee, on examining the question of the hours of work of running staff, had observed that notwithstanding the schedule of running trains being prepared in a manner that the prescribed duty hours of drivers were not infringed, in many cases, the actual duty hours exceeded the scheduled periods resulting in long hours of duty of goods train drivers. The Kunzru Committee noticed that there was an appreciable number of cases where drivers remained on duty for over 20 hours at a stretch. While accepting the position that there was no prospect of the operating conditions on the busy sections of the Railways easing in the near future to an extent so as to reduce the hours of goods train drivers appreciably, the Kunzru Committee suggested that the Railway Administrations should make suitable arrangements to ensure that no goods train driver performed running duty of more than 14 hours at a stretch except in emergencies.

264. The Railway Board in their comments indicated that the Railways had been asked to ensure that no driver was permitted to work beyond the limit of 14 hours at a stretch except in an unforeseen emergency and that the Railways were being asked from time to time not to slacken in their efforts to eliminate excessive hours of running duty at a stretch to the maximum extent possible.

265. The hours of work are regulated by the provisions of the Indian Railways (Amendment) Act, 1956, as amplified by the Award of the Adjudicator, the Honourable Mr. Justice G. S. Rajadhyksha. According to these, in the case of running staff, the running duty hours at a stretch should not ordinarily exceed 10 hours and that they should be entitled to claim relief after 12 hours provided they give 2 hours notice for relief to the Controller and that for the purposes of computing running duties at a stretch, time should be calculated from the actual departure of the train. We are, therefore, unable to understand how the Kunzru Committee laid down 14 hours as the maximum hours of running duty in the face of the foregoing provisions. They had in fact referred to these provisions in their report. The limit according to these should be 12 and not 14 hours of running duty.

266. The incidence of more than 12 hours of running duty at a stretch during 1967-68 on the Indian Government Railways is shown in the table below:—

TABLE 57

Railway	Drivers Grade A & B					
	Total Number of trips	Number of trips with more than 12 hrs. of running duty		Number of trips with more than 14 hrs. of running duty		
		No.	%	No.	%	
Central	1,01,292	350	0.3	151	0.2	
Eastern	78,879	..	..	..	..
Northern	1,79,657	1,091	0.6	206	0.1	
North Eastern	44,592	657	1.5	14	0.03	
Northeast Frontier	10,726	274	2.5	86	0.8	
Southern	1,64,296	1,925	1.2	672	0.4	
South Central	Figures not furnished					
South Eastern	50,551	821	1.6	101	0.2	
Western	1,19,424	522	0.4	17	0.01	
Total	7,49,417	5,640	0.8	1,247	0.2	

Railway	Drivers Grade C					
	Total Number of trips	Number of trips with more than 12 hrs. of running duty		Number of trips with more than 20 hrs. of running duty		
		No.	%	No.	%	
Central	2,29,193	36,526	15.9	2,412	1.1	
Eastern	1,90,328	28,723	15.1	1,330	0.7	
Northern	3,85,732	21,864	5.6	1,338	0.3	
North Eastern	79,645	7,502	9.4	217	0.3	
Northeast Frontier	42,233	8,557	20.3	210	0.5	
Southern	1,66,628	30,894	18.5	1,591	0.9	
South Central	*1,32,876	45,659	34.3	2,682	2.0	
South Eastern	1,88,772	13,268	7.0	243	0.1	
Western	2,36,655	41,540	17.6	398	0.2	
Total	16,52,062	2,34,533	14.2	10,421	0.6	

NOTE : *South Central Railway did not include trips of less than 10 hours duration.
L/P(D)1RB-5 (a)

267. The figures in the above table show that in 14 per cent of trips, grade 'C' i.e. goods train drivers performed running duty of more than 12 hours. Apart from the South Central Railway which did not furnish complete information, it would appear that the Northeast Frontier Railway had the largest number of cases of drivers performing more than 12 hours of running duty followed closely by the Southern, the Western, the Central and the Eastern Railways. On these Railways, the trips of running duty of more than 12 hours range between 15 per cent and 20 per cent of the total number of trips performed by goods train drivers during 1967-68. Every Railway had instances of trips exceeding even 20 hours of running duty.

268. It would appear that further efforts are needed to ensure that the goods train drivers do not perform duty beyond the prescribed limit.

269. We understand that the Railway Board have now issued instructions to the Railways that the overall duty hours of running staff at a stretch should not exceed 14 from the time of 'signing on' and they should be entitled to claim relief after 14 hours provided they have given 2 hours notice for relief to the Controller. These instructions permit the running staff to give notice at the end of 12 hours from the time they 'sign on' irrespective of whether they have done running duty of 12 hours or less. While no doubt this is a step in the right direction, we feel that what is more important is that steps should be taken to ensure that the limit laid down in these instructions is observed in actual train operation. Whenever on any section, chronic long hours seem inherent, steps should be taken to change the crew at a suitable place so as not to infringe the prescribed duty hour limitations.

270. *Railway Service Commissions and recruitment*:—[Recommendations 48, 49—Part II]—The Kunzru Committee had noticed widespread shortages in the strength of operating staff on different Railways and commend on defective planning of staff requirements. According to the Railway Board, the shortages in certain operating categories were due to the delays inherent in the procedure of recruitment through the Railway Service Commissions by mass examination and the unanticipated failure of the selected candidates to pass the medical tests and the departmental examinations after the training course. Due to the number of candidates responding to an advertisement running into thousands, the Commissions, it was stated, experienced inadequacy of staff in handling promptly such a large number of applications.

271. The Kunzru Committee suggested the setting up of a Man-Power Committee on each Railway for assessing in advance the staff requirements and the creation of some supernumerary posts to meet unforeseen shortages of staff. They recommended separate recruitment for posts in the operating categories and for office and commercial clerks and suggested that the examinations should be held to a fixed schedule and the results finalised within three to four months' time. It was also recommended that the minimum strength of Railway Service Commissions should be two Members and the strength may be increased according to the workload. At least one of the Members should be a serving or retired Railway officer. The Commissions should have permanent ministerial staff recruited either from the Railways or from the open market.

272. In pursuance of these recommendations, the Railway Board issued instructions for grouping staff for recruitment as under:—

- (a) technical categories, i.e., electrical or mechanical chargemen, foremen, assistant permanent way inspectors, assistant inspectors of works, etc;
- (b) non-technical popular categories, e.g. guards, ticket collectors, trains clerks, commercial clerks, office clerks, etc; signallers and assistant station masters are included in this category;
- (c) non-technical categories, e.g. traffic apprentices, commercial apprentices, train examiners, firemen, etc.

273. The Railway Board laid down that from the date of receipt of indent by the Railway Service Commission until finalisation, a time schedule of 5 months in case of technical categories, 7 months in case of non-technical categories and 75 days in case of probationary assistant station masters was to be observed; in the case of the last category, separate semi-mass examinations were to be held.

274. The average time taken by the various Railway Service Commissions for recruitment of certain categories of staff during the last five years as furnished by them is shown below:—

(i) *Railway Service Commission, Madras*

(a) Mass categories	..	..	..	Southern Railway	..	One year
				South Central Railway	..	8 months.
(b) Assistant station masters & signallers	..	..	..	Southern Railway	..	6 months
				South Central Railway	..	4 months.
(c) Assistant permanent way inspectors	..	..	..	Southern Railway	..	3½ months.
(d) Assistant bridge inspectors	..	..	..	Southern Railway	..	5 months.

(ii) *Railway Service Commission, Bombay*

Year	Technical and non-technical categories		Non-technical popular categories	
	Central	Western	Central	Western
	Y.M.D.	Y.M.D.	Y.M.D.	Y.M.D.
1963-64	..	..	..	..
1964-65	..	..	..	..
1965-66	..	..	..	..
1966-67	..	..	..	..
1967-68	..	..	..	..
	0.6.26	0.3.23	0.9.23	..
	0.5.04	0.3.24	..	0.7.20
	0.3.04	0.2.18	0.7.12	0.6.22
	0.3.20	0.6.28	..	..
	0.4.18	0.5.04	1.0.11	0.10.21

Y.M.D.=Year : Months: Days.

(iii) *Railway Service Commission, Allahabad*

Categories	Date of requisition	Date of finalisation	Time taken
(a) Station Masters group (Northern Railway)	.. 31.5.63	29.2.64	9 months
(b) Block Maintainers (Northern Railway)	.. 18.12.61	28.4.64	2 years
			4 months.
(c) Apprentice train examiners (Northern Rly.)	.. 25.2.64	3.2.65	1 year.
(d) Assistant permanent way inspectors (North Eastern Rly.)	.. 30.4.65	23.4.66	1 year.
(e) Assistant Signal Inspectors (Northern Railway)	.. 3.3.66	3.11.66	8 months.
(f) Station Masters group (Northern Rly.)	.. 10.8.66	11.8.67	1 year.

(iv) *Railway Service Commission, Calcutta*

Categories	Date of requisition	Date of finalisation	Time taken
(a) Assistant Permanent Way Inspectors (Eastern Rly.) (Diploma holders)	18.12.63	28.7.64	7 months.
(b) Assistant Permanent Way Inspectors (South Eastern Rly.) (Diploma holders)	13.9.63	22.4.64	7 months.
(c) Apprentice train examiners (South Eastern Rly.) (Diploma holders)	14.7.66	13.4.67	9 months.
(d) Popular non-technical categories (Eastern Rly., South Eastern Railway)	June 1965 June 1966	May 1966 June 1967	11 months. 1 year.
(e) Assistant station masters (Eastern Rly.) ..	21.6.65	2.6.66	11½ months.
Assistant station masters (Eastern Railway) ..	19.4.67	15.12.67	8 months.
Assistant station masters (South Eastern Railway)	19.9.64	30.4.65	7½ months.
Assistant station masters (South Eastern Railway)	25.2.66	2.6.66	3 months.
(f) Assistant Permanent Way Inspectors (Eastern Rly.) (Non diploma holders)	18.12.63	28.7.64	7 months.
(g) Assistant train examiners (South Eastern Railway) (Non diploma holders)	21.6.66	19.4.67	10 months.

275. It would appear that the time schedule prescribed by the Railway Board has been often exceeded for all the categories by all Railway Service Commissions.

276. The Railway Administrations are according to the present procedure required to place indents on the Commissions for each quarter i.e. 5 months in advance of their requirements for technical categories, 6 months for non-technical popular categories and 7 months in case of non-technical categories. Visualisation and planning of staff requirements 5 to 7 months in advance can by no means be deemed as impracticable. However, one of the Commissions observed that many of the panels had been either partially used or not used at all by the Railway administrations on the plea of the vacancies anticipated at the time of placing of indents not materialising. Another Commission observed that the percentage of actual materialisation of panels was on the average about 62 per cent. This may partly be due to requirements of staff not being planned by the Railway administrations with due care and partly due to unduly long time lag in finalising the recruitment. At this stage, we would only observe that it is necessary that the Railway administrations should assess their requirements on a rational basis, the Railway Service Commissions should observe the time schedule and the offers of appointment to the selected candidates should be made within a reasonable time if the whole exercise is not to be wasteful. We shall revert to the subject of procedure of recruitment in Part II of our Report.

277. The Railway Service Commissions reported that they got adequate response for the various operating categories advertised from time to time. However, at times there had been difficulties in the availability of candidates belonging to scheduled castes and scheduled tribes particularly in technical categories. In such cases, the candidates selected from other communities were suggested for the consideration of the Railway administrations. The qualifications advertised were generally not relaxed.

278. The strength of each Railway Service Commission was one Chairman and two Members. However, since as a result of the ban imposed in August, 1966 on direct recruitment, there had been a drop in the work of recruitment, the set up of the Railway Service Commissions had been revised to consist of a Chairman and one Member-cum-Secretary with an Assistant Secretary in Class II cadre. The Commissions have experienced no difficulty in respect of staff.

279. In regard to recruitment of Class IV staff, the North Eastern Railway observed that the procedure for recruitment is cumbersome and results in delays and has suggested that the selection boards for recruitment of class IV staff should not include non-Railway personnel. We believe this difficulty is experienced by other Railways also. We are of the view that this aspect needs consideration and simplification of procedure for recruitment of class IV staff and elimination of undue restraints in this behalf would be a step in the right direction.

280. *Employment of sons of railway employees:*—[Recommendations 47 (Pt. I), 50 (Pt. II)]—The Kunzru Committee recommended that a certain percentage of posts in class III and class IV should be filled in by direct recruitment of the sons of railway employees to give an incentive to the staff and to create a sense of belonging in them. They suggested that General Managers should be empowered to fill in 25 per cent of the vacancies from amongst the sons of railway employees.

281. The Railway Board have advised us that the matter was considered in all its implications. While it is recognised that the reservation of vacancies for sons of railway employees would be conducive to improvement in the morale as well as the efficiency of staff in view of the provision of the Constitution of India the recommendation could not be accepted.

282. The evidence tendered before us at all levels and the views furnished by the Railways are unanimous in emphasising the need for giving weightage to the sons and close relatives of railway employees in order to ensure loyalty and efficiency through continuity of tradition of service. We shall advert to this again in Part II of our report.

283. *Direct recruitment in supervisors' grades:*—[Recommendations 56, 57(i) to (vii), Part II]—The Kunzru Committee observed that the supervisors constitute the backbone of the Railway administration. It was noticed by the Committee that the promotions of staff to supervisory grades and of supervisors to officers' grade had been rapid, thereby diluting the experience and quality of supervisors. With a view to developing the right type of supervisors in adequate numbers, the Kunzru Committee suggested direct recruitment to certain initial and intermediate grades so that these people would be available to assume positions as senior supervisors within a short time, and, subsequently in the class II service. The percentages of direct recruitment suggested for the various categories of staff were as under:—

(a) Train Examiners	..	..	..	..	..	..	50%
(b) Grade I Firemen	..	..	..	..	..	..	75%
(c) Mechanical Chargemen	..	..	..	..	..	..	80%
(d) Assistant Block and Signal Inspectors	..	..	..	..	..	..	66·6%
(e) Assistant Permanent Way Inspectors	..	..	..	..	..	..	75%
(f) Traffic Apprentices	..	..	..	..	..	..	33%
(g) Engineering graduates for posts in the grade of Rs. 335—425/335—485 (AS)	..	..	..	..	..	..	20 to 25%*

* To be recruited by General Managers.

284. The Railway Board accepted the suggestions of the Kunzru Committee with the proviso that the existing percentages for direct recruitment for the various categories need not be changed where these were different from those indicated by the Kunzru Committee. The Board, in addition, allowed the recruitment of engineering graduates without the agency of Railway Service Commissions upto 25 per cent for a period of 3 years in the first instance and then permitted it to continue beyond this period.

285. We have surveyed the extent of direct recruitment to the said categories on the different Railways for a period of 3 years *vis-a-vis* the percentages prescribed by the Board. The information is contained in Annexure LXIX.

286. It would appear that the Northern Railway has fixed a percentage of 75 in case of traffic apprentices and 66 $\frac{2}{3}$ per cent in case of assistant signal and block inspectors against the percentages prescribed by the Railway Board which are 25 per cent and 40 per cent respectively. The Railway has not furnished any reasons for adopting these enhanced percentages.

287. We also find that the Railways have in several cases made direct recruitment in certain categories in excess of the percentages prescribed by the Board. The Central and the Eastern Railways have indicated that recruitment in excess of the authorised percentages was done to make good the deficiencies of the previous years.

288. Direct recruitment of engineering graduates was made only as Inspectors of Works or Signal and Telecommunication Inspectors and that too to a limited extent.

289. The Kunzru Committee had while discussing the issue observed that not only should the recruitment be continued upto the prescribed quota but all the shortfalls must also be made good. We can realise the need of direct recruitment to these categories but we feel that these recruitments should be regulated judiciously so that reasonable chances of promotion of staff already in service are not diminished in a particular year as is likely to be the case if an attempt is made to clear the accumulated deficiencies in one or two years. Such action would tend to affect the morale of the staff in service adversely.

290. *Disciplinary powers for supervisors*:—[Recommendations 46—Part I, 61, 63, 64, Part II]—The Kunzru Committee observed that the principal agency for creating a better morale amongst staff and enforcing discipline are the immediate supervisors and that to enable the supervisors to perform this function effectively, it is necessary that they should be treated as part of the Administration. To this end, the Kunzru Committee suggested concrete measures like reduction in size of their jurisdiction, powers to sanction leave, issue of passes, taking of disciplinary action in a limited sphere, etc.

291. The Railway Board asked the Railways to give the supervisors in grade 250—380(AS) and above the powers of issuing privilege passes and privilege ticket orders over the home line to class III and class IV staff, of awarding punishments like fine, censure, stoppage of privilege passes or PTOs or both to class IV staff and to class III staff in scales of pay rising upto Rs. 180; and of sanctioning casual leave and earned leave upto 15 days to class III and class IV staff. The Railways have indicated that the instructions of the Board have been carried out.

292. *Exercise of powers by supervisors:*—We have examined the extent of actual exercise of disciplinary powers by the supervisors and shown the results in Annexure LXX. A summary showing the number of supervisors who exercised disciplinary powers and the nature and extent of punishments given by them is as follows:—

Total number of Supervisors	Total number of Supervisors who exercised powers		Percentage	
3354	1417		42·2	
Nature of punishments	Class III Staff		Class IV staff	
	Number of staff punished	Percentage	Number of staff punished	Percentage
(i) Stoppage of Passes & PTOs.	1613	16·5	5593	14·2
(ii) Fines	1390	14·3	9165	23·3
(iii) Consured	2357	24·1	8506	21·7
(iv) Warned	4408	45·1	16055	40·8
(v) Total	9768	..	39319	..

293. It would appear that about 42 per cent of the supervisors exercised the disciplinary powers. About 41 to 45 per cent of the punishments awarded were however in the nature of "warning" which in effect is not a punishment.

294. We consider that for an administration to run efficiently and successfully, the position and the morale of supervisors are matters of utmost importance and we propose to deal with this matter further in the second part of our Report.

295. *Jurisdiction of Supervisors:*—[Recommendations 113, 186, 187 and 188—Part II]—The Kunzru Committee had recommended that:—

- the beat of a permanent way inspector should be about 40 miles with two assistant permanent way inspectors under him;
- a traffic inspector should not normally be given charge of more than 20 to 25 stations, and the categories of inspectors should also be rationalised by a suitable amalgamation of their duties;
- the strength of loco inspectors and carriage and wagon inspectors should be determined on a rational basis; and
- the number of signal inspectors should be determined on the basis of the number of lever units to be maintained by them.

296. The Railway Board have observed that:—

- (a) the Efficiency Bureau of the Board suggested the guidelines according to which the jurisdiction of a permanent way inspector on the broad gauge should not normally exceed 90 to 100 equated track kilometres on single line, 120 equated track kilometres on double line and 140 equated track kilometres on multiple lines, i.e., roughly a section of 60 to 70 route kilometres on single line, 50 route kilometres on double line and 40 route kilometres on multiple lines; on the metre gauge main lines, the beat should be limited to 75 to 80 kilometres on single line and 90 to 100 kilometres on double line. A permanent way inspector should not have any personal length and the assistant permanent way inspectors placed under him would have specified sections. The guidelines are being followed by the Railways and jurisdictions are being reviewed, where necessary;
- (b) the jurisdiction of traffic inspectors has been suitably modified on all the Railways but any change in the duties of inspectors with a view to rationalising them was not considered desirable;
- (c) the time is not opportune for laying down a yardstick applicable to all Railways but that all Railway administrations have been advised to ensure that the strength of loco inspectors and carriage and wagon inspectors is adequate to meet the requirements;
- (d) the number of signal inspectors has been determined on the basis of lever units on all Railways except on the South Central and the Western Railways where it is in the process of implementation in respect of the additional assets now being provided; the position has to be reviewed from time to time on the basis of additional assets brought into use.

297. The jurisdictions of the supervisors referred to by the Kunzru Committee have been examined by us. The results of the examination are contained in Annexure LXXI.

298. We find wide variations in the jurisdictions of the various categories of supervisors on the different Railways. For instance—

- (a) in case of traffic inspectors during 1967-68, the number of stations varied between 8 and 115 on the different Railways, the largest number of stations under a traffic inspector being on the South Central Railway;
- (b) in case of permanent way inspectors, the maximum jurisdiction on the different Railways during 1967-68 varied between 108 and 239.34 equated track kilometres. The Northeast Frontier and the South Central Railways indicated their jurisdiction only in kilometres (with 249.54 and 338 kilometres as the maximum jurisdiction of a permanent way inspector) and not in equated track kilometres;
- (c) in case of block inspectors and signal inspectors, the Northern Railway has shown 24,806 and 50,216 lever units as the minimum and maximum in the case of the former and 11,362 and 13,935 as the minimum and maximum in the case of the latter during 1967-68. The number of lever units given by the Northern Railway are so inordinately in excess over the corresponding figures

of other Railways that we are not inclined to place reliance on these figures. Against this, the Southern Railway has indicated 28 and 74 as the minimum and the maximum for block inspectors and 362 and 1,704 as the minimum and the maximum for signal inspectors;

- (d) in case of loco inspectors, the Eastern Railway has a yardstick of one loco inspector for 1,80,000 engine miles per month, or for 90 engines or for a strength of 600 running staff; the Northern Railway provides one loco inspector for 100 locomotives or for two sheds; the North Eastern Railway has one loco inspector for 100 locomotives and the Northeast Frontier Railway one for each district. Other Railways have mentioned that the strength is determined by the workload;
- (e) in case of carriage and wagon inspectors, the Northern Railway has one such inspector for each division, the North Eastern and the Northeast Frontier Railways one for each district. Other Railways have replied that the strength is determined by the workload and no specific yardstick has been laid down.

299. It is thus evident that very little seems to have been accomplished to bring about a measure of uniformity in the jurisdiction of inspectors over the various Railways. In our view, the evolving of yardsticks and their application with local adjustments as may be considered necessary, is essential if the strength of supervisors is not to vary widely on the different Railways.

300. *Custody of stores by Permanent Way Inspectors*:—[Recommendation 114 Pt. II]—The Shahnawaz Committee, 1954 observed that there was need for providing some clerical assistance to the PWIs in order to relieve them of the work of stores so that they would have more time to attend to the maintenance of track. The Kunzru Committee also examined the problem of the workload of the Permanent Way Inspectors both in regard to the jurisdiction and the responsibility in respect of custody and accounting of stores. They suggested that a special officer should be appointed on each railway to evaluate the workload of each PWI and to recommend the relief needed.

301. The Railway Board accepted the recommendation for examining the workload of the PWIs. The Efficiency Bureau in the Board's office investigated the question.

302. The Railway Board have stated that in pursuance of the investigations by the Efficiency Bureau, an experimental Permanent Way depot is being set up on each Railway, and new procedures are being introduced for the maintenance of accounts. They have further indicated that two clerks are provided to each PWI on the Railways and a number of other steps such as rationalisation of their jurisdiction, making the stores clerks responsible for locked up and fenced stores etc. have been taken to enable the PWI to concentrate on maintenance work. The question of providing further relief to the PWIs to enable them to devote their undivided attention to outdoor work is under consideration.

303. *Personalised training and man-to-man contact*:—[Recommendation 40—Part I]—The Kunzru Committee observed that safety is largely a state of mind which conditions a man's behaviour in work and his response to safety instructions and guidance. The average worker according to the Kunzru Committee is not wilfully careless and negligent but he does tend to drift into habits of thoughtlessness; therefore, the necessity of his being careful has to be constantly kept before his mind. It is here that according to the Kunzru Committee personal contact assumes importance. This was amply borne out by carefully conducted tests in foreign countries which revealed that the weakness in the mass educational methods like films, posters, lectures, conferences and so on, lay in leaving the interpretation and application of specific items to the individual. In order to break down the emotional barriers or to carry the personality of the officers to the staff, there is a great need for personalised training to carry home the message of safety. With this end in view, the Kunzru Committee recommended the launching of a carefully planned well directed personalised safety programme for dealing with the driving staff, the station staff, gatemen and the permanent way staff on a 'man-to-man' basis and conducted on educational, instructional, informative and persuasive lines by a specially selected team of competent supervisors.

304. The Railway Board in their comments stated that the value of personalised contact with staff as a means to develop safety consciousness had already been recognised and that this was the main function of the safety counsellors.

305. The Railways have indicated that personalised contacts have been established with the staff connected with the movement of trains by safety officers and safety counsellors as well as by officers of other departments.

306. We understand that the Railways furnish to the Railway Board the figures of the number of staff contacted in their periodical reports. Often, the number of staff said to have been contacted on a Railway in a year runs upto nearly a lakh or, at times, more than a lakh. For instance, on one Railway, the number of staff contacted was 1,17,955 during 1964-65 and 93,121 during 1966-67, i.e. 323 and 255 persons per day in 1964-65 and 1966-67 respectively. We are afraid, in such an approach, there is a danger of obsession with numbers overshadowing all other considerations amongst the officers and counsellors. In our view before an officer, a counsellor or any other supervisor can carry home to the staff the message of safety, he has to establish a personal equation between himself and the employee and to give to the latter individual personal attention. Such personalised contact obviously cannot be judged by numbers alone. There is a real risk of the appeal of counselling being lost if the counsellor must chase only numbers. In fact, we came across a few instances in which the staff told us that they had never been contacted on a personal level nor were they aware of the counselling work on their Railways.

307. In our view, the programme of personalised training on a man-to-man basis needs to be reoriented with an emphasis on the personal contact and understanding between the officer or supervisor and the individual worker and specific individual attention to the latter.

308. *Psycho Technical Cell*:—[Recommendation 36—Part I]—The Kunzru Committee attached considerable importance to the introduction of psycho technical tests for determining the suitability of personnel in certain operating categories to their particular jobs. They had, therefore, recommended that a pilot project for applying such tests to a limited number of drivers, cabinmen and levermen before selection to these posts should be started. The Kunzru Committee suggested that the results of these tests should be assessed before extending them over a wider field.

309. The Railway Board advised us that a Psycho Technical Cell had been set up and had conducted job analysis of the duties of a few categories like pointsmen, cabinmen and drivers with a view to standardisation of tests in order to assess the essential psychological attributes required to be possessed by an employee to be able to carry out the job in a safe manner. These investigations included tests of intelligence, personality, distribution of attention, concentration, form and depth of perception, reaction time, and other attributes special to each category of staff. We were advised that whereas the tests for the pointsmen/cabinmen had been standardised, those for the categories of drivers were still being validated. In addition, certain other studies, like the effect of ageing on the faculties of drivers (working mail/express trains with steam traction) after the age of 45 years have been conducted by the Cell.

310. The Psycho Technical Cell was set up about five years ago. The investigations conducted by it are still in an experimental stage and the stage where the results of these studies can be fruitfully applied has not yet arrived. We are aware that the application of the results of such studies involves considerable preparatory work. There may also be difficulties in getting suitable trained staff for this work. Nevertheless, we consider that if the value of psycho-technology as a means to promote safety in train operation has been recognised by the Railway Board, every thing possible should be done to accelerate the process. We also hope that when the stage arrives for the application of these tests in the selection of personnel, such tests will be handled by well qualified and responsible staff so that they become neither a mere routine nor a source of harassment to the staff.

311. We have elsewhere, in some paragraphs of Chapter II, indicated certain aspects which may be fruitful fields of study for this Psycho-Technical Cell. We had also undertaken a study of the number of staff held responsible for causing two or more accidents, the last one of which was caused during any time within the two years 1966-67 or 1967-68. This was done with a view to finding out the number of staff who had been repeatedly involved in accident cases. The information received from the Railways is in Annexure LXXII. It will be seen from this Annexure that nearly 60 per cent of such employees were in the category of drivers. This study may provide a pointer for psychological counselling and rational persuasion of these and other staff so that in future they may be able to render a relatively accident-free service.

312. *Provision of quarters*:—[Recommendation 80—Part II]—The Kunzru Committee had, during the course of their examination of the amenities provided to the railway staff observed that suitable houses in

healthy surroundings should be provided for as large a number of railway staff as practicable. They suggested the priorities for allotment of quarters as under:—

- (i) staff working at small stations;
- (ii) essential staff at large stations; and
- (iii) essential staff not covered by (i) and (ii).

313. The Kunzru Committee suggested that the allocation for the provision of staff quarters should be raised from Rs. 7 crores to Rs. 12 crores per year during the remaining years of the Third Plan.

314. The Railway Board in their comments indicated that Rs. 44.29 crores were spent on the construction of staff quarters in the Third Plan against a provision of Rs. 35 crores. However, due to the difficult resources position, the expenditure on this item was only Rs. 7.79 crores in 1966-67, Rs. 6.09 crores in 1967-68 and Rs. 5.30 crores in 1968-69. Separate allocation was being made for making improvements in the existing quarters. The Board further stated that the guidelines suggested by the Kunzru Committee for the allotment of quarters were being followed and preference was given to the essential staff subject, however, to various other factors which the Railway administrations may have to take into consideration.

315. We have surveyed the position as it existed on 31.3.1964 and on 31.3.1968 regarding the provision of railway quarters to ten of the essential categories of staff who are mainly concerned with train operations. The position as it emerged from this survey is as under:—

TABLE 58

Category of staff	Percentage of various categories of staff provided with quarters	
	As on 31.3.1964	As on 31.3.1968
1. Station Masters	94.3	94.2
2. Asstt. Station Masters and Switchmen	72.4	70.9
3. Cabinmen, Levermen & Pointmen	66.1	66.9
4. Shunting Jamadars/Gunners/Shunting Masters and other shunting staff	56.9	62.7
5. Guards	56.9	59.1
6. Drivers and Shunters	57.1	64.8
7. Firemen and Asstt. Drivers	39.7	46.5
8. Motormen	60.4	66.7
9. Train Examiners	55.3	57.8
10. Block, Electric and Mechanical Signal Maintainers	58.4	62.2

316. We find that in spite of the fact that the strength of staff has practically increased in all categories, the percentage of those provided with railway quarters has also kept pace and in the case of some categories e.g. drivers and shunters, firemen and assistant drivers and train examiners, the position has shown definite improvement. We, however, feel that a lot more remains to be done and particularly in certain categories like that of assistant station masters employed at roadside stations, the provision of quarters must be improved if they are not to leave the stations frequently to see their families.

317. The position on the different Railways in regard to the provision of quarters to the categories of staff referred to earlier is contained in Annexure LXXIII.

318. We consider that the absence of suitable accommodation for staff posted at wayside stations can be a source of fatigue and worry. The staff cannot always arrange suitable accommodation outside due either to prohibitive rents or to non-availability of such accommodation. Particularly for railway staff concerned with train operation, the provision of the railway quarters is a matter of necessity rather than an amenity and would prove conducive to increasing the element of safety in train operation.

319. *Morale of Officers—Outside interference:*—[Recommendation 72—Part II]—The Kunzru Committee had observed that the morale of officers was at a low ebb and that the officers were reluctant to exercise their discretion for fear of not being supported by the higher authorities. The Kunzru Committee had said that having selected officers to administrative posts, it is essential that their morale should be kept high by trusting and respecting them. According to the Kunzru Committee, great frustration was caused to officers whenever through the intervention of an influential outsider, their bonafide decisions were not only called to question but were often set aside. This had the effect of many executive officers preferring to let things drift instead of taking positive action. The Kunzru Committee had noted that the officers of the Railway administrations had been directed that they were, on getting a reference from the Members of Parliament on staff matters, to request the latter to address the Minister, and had ended with hoping that those concerned would bear this in mind.

320. The Railway Board stated in their comments that on receipt of the recommendation, the Minister for Railways had addressed a demi-official communication to the Minister of Parliamentary Affairs who in turn had addressed individual letters to all Members of Parliament to desist from making references to officers on individual staff matters.

321. The morale of officers and the impact it has on the running of an organisation are indeed matters to which we attach great importance. The evidence before us so far is rather limited; but even so, some instances were brought to our notice wherein, on routine decisions taken by officers, reports had been called at the instance of higher levels, apparently on the intervention of influential outsiders. We agree that such factors inevitably tell on the morale of officers and their disposition to take right decisions. We intend to give further thought to this in Part II of our Report.

322. *Finalisation of enquiries and disciplinary action*:—[Recommendations 49—Part I and 65—Part II]—The Kunzru Committee found that there were considerable delays in the finalisation of accident enquiries and disciplinary action against the defaulting staff and observed that energetic action on the part of the Railway administrations was required to conform to the target (prescribed by the Railway Board) of 27 days for the completion of accident enquiries and 63 days for the finalisation of disciplinary action from the date of completion of the enquiry.

323. The Railway Board indicated that a watch was being kept on the time taken in finalisation of accident cases and whenever it was noticed that the target was being exceeded on a particular Railway, the matter was taken up at a suitable level.

324. We have examined the time taken in finalisation of accident cases during the years 1966-67 and 1967-68. The result of this examination is given in the following table:—

TABLE 59

Railway	Average number of days taken in finalisation of accident cases					
	From the date of occurrence to the date of finalisation of accident enquiry		From the date of finalisation of accident enquiry to acceptance by competent authority		From the date of acceptance to the date of imposition of final punishment	
	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68
Central	33.5	37.8	72.8	68.2	104.8	97.8
Eastern	15	16	No gap	No gap	50	40
Northern	25	18	22	23	68	68
North Eastern ..	17.6	19.1	33.7	27.2	72.1	48.2
Northeast Frontier	Not shown separately		27.0	26.1	37.3	43.3
Southern	86	58	68	61	156.8	121.3
South Central ..	35	33	32	32	74	61
South Eastern ..	4	5	26	31	39	44
Western	14.3	17.2	21.2	30.9	61.0	56.7

325. It would appear that the time taken on the Southern and the Central Railways is far beyond the targets laid down by the Railway Board. In particular, the long interval of time between the date of finalisation of accident enquiry and the acceptance of findings by competent authority is difficult to appreciate.

326. In Annexure LXXIV, the average number of days taken in finalising the cases involving disciplinary enquiry i.e. in which major punishments like dismissal, removal, compulsory retirement or reduction in rank was proposed) and those in which a disciplinary enquiry was not necessary, have been shown Railway-wise. It will be seen from this Annexure that the time taken in imposition of final punishments in cases which involve disciplinary enquiries is much longer than in other cases. Needless to say that for a punishment to be deterrent it should not only be compatible with the nature of offence but also prompt.

327. Here, it may be observed that there is a widely established notion that the present procedure of disciplinary action which is based on Article 311 of the Constitution is so constructed that it results in delays in taking disciplinary action against the erring staff. To see to what extent delays in meting out the punishment are ascribable to the present procedure and whether the concept of reasonable and adequate opportunity afforded to the erring employee under this Article of the Constitution is abused by the employee by resorting to dilatory tactics, a case study of some accident cases selected at random wherein departmental action was taken was made by us. We find that while there is no gainsaying the fact that the present procedure by its very nature is cumbersome and time-consuming, there is not much substance in the widely held notion that the errant employees often resort to dilatory tactics. On the other hand, our case studies show that if anything, it is more the incidental delays occurring in the departmental office itself which account for the major portion of the delay. We consider that there is scope for considerable improvement if such delays in the processing of the case in the departmental offices are minimised.

328. *Prosecution of staff involved in accidents*:—[Recommendation 12(ii)—Part I]—The Kunzru Committee had during the course of its studies examined the results of prosecutions launched during the years 1957-58 to 1961-62 against railway staff involved in accidents and having observed that most of the prosecutions were not successful, had stressed the need for better co-ordination between the Railway administration and the police authorities in launching and conducting of prosecution cases.

329. At that stage, the Railway Board had taken up the matter with the Ministry of Home Affairs and as a result the latter issued a directive to the State Governments asking them to ensure close co-ordination between the authorities concerned with the prosecution and the Railway authorities so that the cases were prepared properly and the evidence marshalled in close consultation with the Railway authorities. Having been apprised of this development, the Kunzru Committee had expressed the hope that the co-ordination between the two as a result of this fresh directive would result in a more satisfactory state of affairs.

330. To a questionnaire addressed to the Railways, the consensus of replies indicates that the position in this regard has not changed much and that ordinarily the police authorities do not consult the railway administration before launching prosecutions against the staff involved in accident cases. In fact, in most cases, the State authorities not only do not consult the railway authorities to secure their cooperation in effecting successful prosecutions but do not even show the courtesy of giving information about their plans to launch a prosecution. Naturally, thus, continuous co-ordination with the police authorities with a view to effecting a successful prosecution is not usually possible. There have been cases in which some of the railway staff were not responsible for accidents in the opinion either of the railway administration or of the Additional Commissioner of Railway Safety and yet were prosecuted by the police with the result that a lot of unnecessary harassment resulted to the staff concerned. On the other hand, in some cases, the employees involved in accidents, in order to evade departmental action, manoeuvred to get themselves prosecuted thinking that in the event of prosecution, there was

a good chance of getting an acquittal from a law court and thereby frustrating departmental action whereas if they were to face departmental action, punishment would be well-nigh certain.

331. The number of prosecutions launched in accident cases and the results thereof during the 5 years, 1963-64 to 1967-68, on the Indian Government Railways are shown in the table below:—

TABLE 60

Railway	Number of cases in which staff were prosecuted	Number of cases in which staff were convicted	Number of cases in which staff were acquitted	Number of cases subjudice
Central	6	2	2	2
Eastern	27	2	8	17
Northern	20	2	12	6
North Eastern	50	2	19	29
Northeast Frontier	7	—	2	5
Southern	5	—	4	1
South Eastern	26	5	12	9
South Central	4	1	1	2
Western	27	5	4	18
Total	172	19	64	89

332. The results indicated in the table speak for themselves. In hardly 11 per cent of the cases, conviction was secured. Against every case of conviction, more than 3 acquittals resulted. What is worse, a large number of cases linger on for long periods. According to the information given by the Railways, at the end of 1967-68, 89 out of 172 cases, i.e. more than half were still subjudice, several of these dating back to 1963-64 and 1964-65.

333. It will, thus, be seen that the hopes expressed by the Kunzru Committee have by and large, not been fulfilled.

334. It, therefore, appears to us necessary that ways should be explored whereby in accident cases, the railway staff are not prosecuted unnecessarily, nor are they able to manoeuvre to be prosecuted to evade departmental action.

335. For ordinary crimes, like embezzlement, forgery and so on, the police generally does not move unless a report is made by the department concerned. A case of a railway accident, however, is a matter which is a public affair and under section 83 of the Indian Railways Act, the police have to be informed about it. The police then take over and decide for themselves whether to prosecute or not without making prior consultation with the railway authorities.

336. We may in this connection point out that Section 197 of the Code of Criminal Procedure provides for protection to a Judge, a Magistrate or any public servant who is not removable from his office save by or with the sanction of the State Government or the Central Government in the matter of prosecution if such prosecution is in connection with any offence alleged to have been committed while acting or purporting to act in the discharge of his official duties. In such a case, Section 197 of the Code of Criminal Procedure provides that no Court shall take cognizance of such offence except with the previous sanction of the State Government or the Central Government, as the case may be. This provision is intended to protect officers covered thereby from unnecessary harassment when acting in the discharge of their duties. With the provision as it stands, were a Class I officer to be prosecuted in connection with an accident (which is hardly likely), the prior sanction of the Government would be required for his prosecution. It seems to us that similar provisions should be made as a special case in the matter of prosecutions of railway staff in Class III and IV involved in accidents.

337. We consider that it would be advantageous if a provision is made in Section 101 of the Indian Railways Act to the effect that no Court shall take cognizance of an offence under this Section or the cognate sections of the Indian Penal Code, namely, Sections 304A, 336, 337 and 338 without the sanction of the authority who is entitled to remove the railway servant from office. A provision inserted as a sub-section to Section 101 of the Indian Railways Act will thus ensure that no prosecution of a railway servant in connection with an accident is launched without the sanction of the competent authority. Such authority would be in the best position to determine whether there should be a prosecution and, if so, who should be prosecuted. The competent authority should be in a position to exercise its mind on that question as soon as the enquiry report on the accident is available.

338. It may be added that where the police authorities feel that the competent railway authority is withholding sanction wrongly, they can always approach the Railway Ministry for getting the necessary sanction.

339. This procedure would have four-fold advantages. It will save employees from unnecessary harassment. It will also make it impossible for any railway servant to manoeuvre his prosecution in order to be able to evade departmental punishment. It will also provide for complete co-ordination between the police and the railway authorities since once the railway authorities decide that a case is fit for prosecution, they would ensure that proper evidence is led so that the prosecution comes to a successful conclusion. And finally, since the decision to launch prosecutions or not would have to be taken by the Railway administration, the needless delays which are, at present, caused in the publication of the Reports of the Additional Commissioner of Railway Safety where there may be a possibility of prosecution would thus get obviated. The Railway administration would on receipt of the Additional Commissioner of Railway Safety's Report, be in a position to decide whether they would take departmental action or would prosecute the railway servants responsible. Since prosecutions would be resorted to in a very few cases, the publication of the Additional Commissioner of Railway Safety's Reports in cases where prosecution is not to be launched need not be held up on this account.

340. We would like to think that in most accident cases, departmental action would meet the ends of justice and prosecutions of railway staff would be necessary only in a comparatively few cases of a serious nature.

Safety Organisation, Rules and other operating matters

341. *Safety Organisation*:—[Recommendations 59(i) to (iii) and 60 Part I and 181 Part II]—The Kunzru Committee had suggested the creation of a suitable organisation at the various levels of the Railway Administration to deal with problem of accidents and safety and to undertake the tasks enumerated by the Committee in their Reports. They spelt out their proposals as under:

- (a) an Additional Member assisted by a joint Director in the Railway Board's office to deal with the problems of safety of train movements on the Railways;
- (b) in the headquarters office of each Zonal Railway, a Deputy Chief Operating Superintendent in the intermediate administrative grade on the Railways working on the Divisional system and in the junior administrative grade on the Railways working on the District system;
- (c) a Safety Officer either in the senior scale or in the junior scale in each division or District; and
- (d) a team of specially selected Safety Counsellors drawn from different branches of the Divisions to be selected on the basis of service, experience, capacity and qualities.

342. These recommendations were accepted and implemented by the Railway Board with some modifications. In the Railway Board's office, a Safety Directorate was created under the charge of a Director assisted by a Joint Director. The post of the Joint Director in the Safety Directorate has since been abolished as an economy measure. On the Zonal Railways, the Safety Organisations were placed under Transportation Superintendents (Safety) in the intermediate administrative grades except on the North Eastern and the Northeast Frontier Railways (and later the South Central Railway) where incumbents were in the junior administrative grade. On the divisions and districts of zonal Railways, the posts of Safety Officers were created—some in the senior scale and others in the junior scale.

343. In the evidence given before us and in the discussions with the Railway Board, we were told that the functions performed by the Safety Organisation are in the nature of 'internal audit' on aspects concerning safety in train operation, and viewed from that angle, are highly useful and important. We propose to examine the working of the Organisation in further detail during the course of our forthcoming tours and shall comment on it in part II of our Report.

344. *General Rules—Revision*:—[Recommendations 90 and 91 Part II]—The Kunzru Committee had suggested that a revised set of general rules consistent with the conditions obtaining at the time and likely to

obtain in the foreseeable future was overdue and should be issued without undue delays. According to them, the present rules suffered from various defects; rules relating to particular subjects were according to the Kunzru Committee found scattered in various parts of the book; of other rules, the wording was obscure and legalistic and in some cases the rules were incomplete with the result that a number of subsidiary rules had to be issued by Railway Administrations to supplement them.

345. The recommendation had been considered in some detail by the Railway Board. At that stage they had held that no wholesale revision of the general rules was necessary though individual rules were amended from time to time to the extent considered necessary keeping in view the need for integration, simplicity, amplification and uniformity. The Board, had, at that stage, maintained that the revision of general rules was a continuous process and that the rules were amended, edited, amplified or weeded out to suit the requirements of the growing system. Whenever any flaws in the general rules came to light they were suitably remedied, and new rules where required were provided to cater for new developments like multiple aspect signalling or centralised traffic control etc.

346. We have now been advised that a few months ago, a team consisting of a Joint Director from the Transportation Department and a Deputy Director from the Signalling Department were deputed 'to examining the possibility of revising, simplifying and bringing upto date the general as well as the subsidiary rules in force'.

347. It is not clear to us what led the Board to consider that the revision of General Rules on Railways had acquired a special urgency after 5 years. Nonetheless, we endorse the decision of the Railway Board in appointing a Committee of Officers to go into the general rules with a view to simplifying these since we are of the view that the nature of the task is such that a detailed and thoughtful study is required which only experienced and full-time officers can give to the task.

348. The Kunzru Committee had also observed that the multiplicity of rules contained in the various books and manuals on the Railways leads to confusion in the minds of the staff and considered that standardisation of working practices is desirable to achieve a higher standard of safety on the Railways. They also suggested that the alterations should be few and far between. We find that the number of Subsidiary Rules on the different Railways is about 3,620. We also came across instances in which a single correction slip contained amendments to a large number of rules. For example on the Central Railway, correction slips Nos. 10 and 11 amended no less than 46 and 42 rules respectively. We hope that the views expressed by the Kunzru Committee about the multiplicity of rules and the need for standardising working practices will be kept in view while reviewing the rules.

349. *Protection of trolleys and lorries*:—[Recommendation 4(iv) Part I and 14(v) Part II]—The Kunzru Committee during the course of their analysis of the collisions between passenger trains and trolleys, etc., concluded that there was no uniformity in the rules and regulations prescribed for the protection of the motor trolleys, lorries and push-trolleys. They noted that while the subsidiary rules of the Southern Railway provided for adequate

protection, those of the Eastern and the Northern Railways left a great deal of latitude to the operators in respect of working of the trollies under block protection. They suggested that the Railway Board should lay down the rules for protection of trollies on a uniform basis for all the Railways. They also noticed that the Eastern Railway had increased the distance for protection of the trollies by flags and detonators from half a mile to three-fourth of a mile. They considered it a step in the right direction in view of the heavier trains running at faster speeds, particularly after the introduction of electric and diesel traction. They suggested that other railways should also issue similar instructions, wherever identical conditions prevailed.

350. The Railway Board have advised us that they considered that instead of unifying subsidiary rules in force on the different railways, the purpose should be equally served if the railways provided for certain minimum basic safety requirements and incorporated them in their subsidiary rules. With this end in view, the Railway Board had set out the basic safety requirements to be provided for in the rules and asked the railways to incorporate these in their subsidiary rules. We agree with this approach. It has been indicated to us that all the railways have modified their subsidiary rules accordingly.

351. As regards the distance for protection of trollies, etc., the Railway Board have advised us that the Railway Administrations have been told that they may, if they consider appropriate, after taking into consideration local conditions and other cognate factors, increase the distance for the protection of trollies by flags and detonators from half a mile to three-fourth of a mile and may incorporate this amendment also in their subsidiary rules.

352. We find that the North Eastern, the Southern and the South Eastern Railways have not considered it necessary to increase the distance for protection of trollies, but other railways have fallen in line with the Eastern Railway.

353. In our view, the distance for protection of trollies or lorries is an important safety factor and the minimum distance necessary to ensure safety should be applicable on all Railways. In the evidence tendered before us, we were informed that a decision is going to be taken in respect of the distance necessary for the protection of a trolley or a lorry. We hope that such a decision will be taken early and a uniform practice followed on the Railways.

354. *Working Time Tables*:—[Recommendations 24, 28(i) and 32(ii) Part I]—The Kunzru Committee had, during the course of their examination of the causes of Mainpuri and Kosgi accidents, noticed certain anomalies in the information shown in the Working Time Tables, such as intersectional minimum running time being not shown prominently and correctly, booked speed of a train being identical with the maximum permissible speed, etc. They recommended that the Working Time Tables should be subjected to a close scrutiny to ensure that:—

- (a) the booked speed is 10 to 12 per cent below the maximum permissible speed,

- (b) the maximum permissible speed, the booked speed and the minimum running time for various type of locomotives are clearly and prominently stated, and
- (c) the minimum running time required to be adhered to on a section is correctly shown for the guidance of the drivers.

355. The Railway Board stated in their remarks that these recommendations have been implemented by all the Railways.

356. We undertook a limited study of the working time tables of the different Railways, in force from 1st April, 1968. Our study of the Working Time Tables disclosed that the anomalies and the deficiencies in the operational details contained in the Working Time Tables as pointed out by the Kunzru Committee still exist.

357. A few of these defects are enumerated below:—

- (i) In certain cases, the normal running time of some trains was less than the corresponding intersectional minimum running time. For instance, on the Central Railway, the normal running time of train No. 301 Dn Deccan Queen Express between Bombay V.T. and Byculla was 6 minutes against the minimum running time of 7 minutes; the normal running time of train No. 302 Up Deccan Queen Express over Poona-Talegaon section was 22 minutes against the minimum running time of 26 minutes. On the Southern Railway, the normal running time of train No. 39 Dn. Brindaban Express over Tyakal-Devau-gonshi section was $19\frac{1}{2}$ minutes against the minimum running time of $22\frac{1}{2}$ minutes; the normal running time of train No. 49 Up Brindaban Express on Bangalore Cantt.—Krishna-rajapuram section was $8\frac{1}{2}$ minutes against minimum running time of 10 minutes.
- (ii) The margin between the booked speed and the maximum permissible speed in a few cases has been found to be either non-existent or less than the prescribed minimum. For instance, on the Ledo-Lakhapani section of the Northeast Frontier Railway, the maximum permissible speed as also the booked speed of the trains was 15 kilometres per hour. On Parbhani-Purli-Vaijnath section of the South Central Railway, the maximum permissible speed was 50 kilometres per hour and the booked speed of some passenger trains was also 50 kilometres per hour. Similarly, on Coimbatore-Podanur section of Southern Railway, the maximum permissible speed was 50 kilometres per hour and the booked speed of some passenger trains was 48 kilometres per hour leaving a margin of only 4 per cent between the two speeds, etc.
- (iii) in some cases the normal running time and the minimum running time were indicated for sections which were not co-terminal;
- (iv) the method of calculating minimum running time also differed from railway to railway. On the Northern Railway, it was worked out on the basis of maximum permissible speed for non-stop run between stations with the addition of time

allowance for permanent restrictions; on the Southern Railway, it was calculated on the basis that every train was a stopping train and included not only the time allowance for permanent restrictions but also for acceleration and deceleration; on the Northeast Frontier Railway the minimum running time did not include even the time allowance for permanent restrictions. There does not appear to be any plausible reason for different practices being followed.

358. We had brought these deficiencies to the notice of the Railway Board's office with a view to their rectification in future issue. We hope that these have since been corrected in the current issue of the Working Time Tables and urge that the Working Time Tables need to be subjected to a thorough scrutiny before issue so that such anomalies and deficiencies do not recur.

Permanent Way

359. *Track Renewals*:—[Recommendations 16, 96, 97, 99 Part II]—The Kunzru Committee looked into the position of track renewals as programmed and completed during the Second Five Year Plan. They found that at the end of 1962-63, the over-all shortfall in the implementation of the programme of rail renewals was of the order of 41 per cent and of sleeper renewals, 23 per cent. They emphasised the need for completion of renewals programmes in the interest of safety and efficiency. They suggested that the Railway Board should watch the position about the availability of track materials from indigenous sources and arrange to secure their import wherever it was essential so that the shortage of materials would not retard the work of track renewals. They further added that the track renewals should be completed early to reduce the length of the track under speed restrictions on the Railways. The renewal work should be so undertaken that continuous sections of the line are not subjected to varying speed restrictions.

360. In their remarks, the Railway Board stated that the position had considerably improved with the development of indigenous resources and that as a result, no standard track materials had been imported since 1962-63. The Board added that the supply of track materials to the Railways is controlled and watched by the Board's office and to this end an effective machinery exists. The arrears of programmed track renewals, they said, have already been liquidated.

361. It has been reported to us that during the period 1963-64 to 1967-68 the following renewals were carried out on the broad, metre and narrow gauge systems:—

(i) Primary Lines

					Kilometres		
					B.G.	M.G.	N.G.
Complete Track Renewals	..	..	..	..	5210	3851	135
Through Rail Renewals	..	..	..	..	1679	992	12
Through Sleeper Renewals	..	..	..	..	2756	882	131

(ii) Secondary Lines

Complete Track Renewals	..	..	..	..	1442	1004	217
Through Rail Renewals	..	..	..	..	531	558	126
Through Sleeper Renewals	..	..	..	..	104	30	33

362. As a result of track renewals carried out, the lengths under speed restrictions due to obsolete or worn track were progressively reduced as indicated below:—

As on 31-3-1963	..	..	..	..	3274 kilometres
As on 31-3-1964	..	..	..	..	2690 ..
As on 31-3-1965	..	..	..	..	2329 ..
As on 31-3-1966	..	..	..	..	1132 ..
As on 31-3-1967	..	..	..	..	748 ..
As on 31-3-1968	..	..	..	..	788 ..

363. On the narrow gauge itself, the aggregate length under speed restriction was reduced from 415 kilometres as on 31-3-1964 to 194 kilometres as on 31-3-1968.

364. We commend the progress made on tracks renewals and hope that the pace of renewals will be maintained. We note that the track under speed restriction on the narrow gauge has been reduced. On the broad gauge and the metre gauge, the lengths of track under speed restrictions also underwent a steady reduction during the four years 1963-64 to 1966-67. During the year ending 31-3-68, the track under speed restriction went up slightly from 748 to 788 kilometres. We hope the speed restrictions attributable to worn or obsolete track will continue to be eliminated and the trend of progress achieved will be maintained.

365. *Welding of rails*—[Recommendations 18(ii) Part I and 100 Part II]—The Kunzru Committee suggested that the progress of welding of rails should be accelerated.

366. The rails are welded in flash butt welding plants and conveyed to sites of relaying, or alternatively, the aluminothermit process is adopted at site. The Railway Board have arranged to procure six new flash butt welding plants in addition to four such plants which are at present being operated at Kalyan and Chalisgaon on the Central Railway, Rosa on the Northern Railway and Bandel on the Eastern Railway. The position in respect of the new flash butt welding plants is as below:—

Railway	Location	Present position
Southern	Arkonam	Plant commissioned
South Eastern	Jharsaguda	Do.
Western	Sabarnati	Do.
Eastern	Mughalsarai	Plant under erection
Northern	Phillaur	Do.
South Central	Maula Ali	Do.

367. The progress of welding of rails has been commendable. The aggregate length of welded track has increased from 4625 kilometres as on 31-3-1962 to 15,220 kilometres as on 31-3-1968. We hope that the pace of welding of rails would be maintained, and even further accelerated.

368. *Supply of Wooden and prestressed concrete Sleepers:*—[Recommendations 98 and 155(iv) Part II]—The Kunzru Committee observed that the supply of all kinds of sleepers including wooden sleepers had to be adequate not only for the present standards of tracks but also to meet the future requirements with increased density of sleepers per rail length. They found that wooden sleepers were widely used on the Railways but supply had been unsatisfactory in the past. The Kunzru Committee urged the Railway Board to develop ways and means of keeping in touch with the progress of the extraction and the availability of wooden sleepers at the depots at regular intervals, so that appropriate action could be taken for the fulfilment of the contracts.

369. The Railway Board have advised us that Sleeper Control Officers and Track Supply Officers on the Railways are in constant touch with the State Forest Departments who are the main suppliers of wooden sleepers. The supply of M.G. wooden sleepers and special size of sleepers such as those for use on the bridges, points and crossings etc. has, according to the Railway Board, been adequate to meet the requirements fully in the recent years. However, the supply of broad gauge hard wood sleepers has been somewhat less. This has been attributed to the dwindling forest resources of the country, particularly the large trees.

370. The Railway Board have reported the position of procurement against requirements as below:—

Year	Requirement of wooden sleepers				Actual procurement of wooden sleepers			
	(figures in lakhs)							
	B.G.		M.G.		B.G.		M.G.	
1963-64	Not available		18.20	19.39
1964-65	15.46	19.89	13.84	21.94
1965-66	14.73	21.55	12.81	18.39
1966-67	14.92	17.38	16.15	13.74
1967-68	21.26	17.29	20.53	19.93

371. It will be observed that there is an overall shortfall in the procurement of wooden sleepers to the extent of 3.0 lakhs on the broad gauge and 2.11 lakhs on the metre gauge over the past four years. This does not bear out that there is no shortage of wooden sleepers on the metre gauge. We were told that some difficulty was experienced on account of some of the wooden sleepers being of softwood. The kilometrage of wooden-sleepered track on broad, metre and narrow gauge systems is as below:—

Gauge	Hard wood				Soft wood			
Broad	4,518	6,593	
Metre	12,739	5,563	
Narrow	2,505	1,048	

372. While allocation of wooden sleepers for renewals in automatic signalling territory, at stations provided with route relay interlocking or track-circuited running lines on both broad and metre gauges, as also similar new works, should be made on priority, we suggest that through renewals of wooden sleepered track on non-track-circuited sections may be carried out with CST-9, or steel trough and prestressed cement concrete sleepers, and the released serviceable second-hand wooden sleepers used for random renewals.

373. The Kunzru Committee had also observed that the shortages of wooden, steel and cast iron sleepers made it incumbent on the railways to go in for an extensive use of pre-stressed concrete sleepers. They added that priority should have been given to the development of a suitable design for concrete sleepers to enable track circuiting to be introduced on heavy density sections. The Kunzru Committee had commented that concrete sleepers had first been tried on the railways as early as 1918-19. They, however, thought that despite the Railway administration being seized of the problem, the general adoption of concrete sleepers would not be possible without extensive field trials over a long period.

374. The Railway Board stated in their comments that the firm to whom the contract for supply of concrete sleepers had been allotted in 1965 having gone into liquidation, sleepers could not be supplied according to the contract. Eventually the contract had to be terminated in November, 1966. Fresh tenders were called for the supply of mono-block prestressed concrete sleepers and it is expected that the concrete sleepers against this contract would be available in a year's time. It has been further indicated that the production of concrete sleepers has not yet started on a large scale and the capacity is being developed for the production of concrete sleepers.

375. We understand that prestressed concrete sleepers have been developed in foreign countries and adopted extensively. We are unable to appreciate the reasons for the Administrations' inability to develop the concrete sleepers to suit railways' special requirements over the last many years. We cannot help expressing our scepticism in the anticipated availability of concrete sleepers in about an year's time when the production of these has not yet started on a large scale. We urge the Railway administrations to make special efforts for introducing the prestressed concrete sleepers on the Indian Railways on an extensive scale in view of the unfavourable supply position of wooden sleepers and their increasing demand for modern signalling.

376. *Gangstrength*:—[Recommendation 103 Part II]—The Kunzru Committee expressed the hope that strengthening of permanent way gangs, as envisaged by the Railway Board, would considerably help to raise the standard of track maintenance. They observed: "Under the conditions created by the increase in traffic and the speeds of trains etc., the Railway Board have gone into the matter of providing adequate gangstrengths for the proper maintenance of the track and have approved of the modified Maffin Formula, as corrected by the Lobo Committee's recommendations, for determining the gangstrengths."

377. The position, as advised by the Railway Board, is as below:—

Railway						Additional men required as per modified formula	Increase actually effected
Eastern	..	..	..	..	..	2,769	1,315
Northern	..	..	..	..	..	1,785	1,352
North Eastern	..	..	..	..	..	4,235	1,410
Northeast Frontier	..	..	..	..	..	1,931	718
South Eastern	..	..	..	..	..	4,783	3,463
Western	..	..	..	..	..	4,898	2,970
Central*	..	..	..	..	..	2,294	Nil
Southern*	..	..	..	..	..	3,702	Nil

*Figures include position on South Central Railway.

378. Vide Railway Board's directive of August 1962, the Railways were advised to augment gangstrengths according to the "modified formula". On the basis of this directive, six Railways went ahead and augmented their gangstrengths. The remaining two Railways (and to a partial extent the other six Railways) could not complete their augmentation due to various administrative reasons like delays in working out the actual strength required, requirement of funds etc. by January 1965 when further implementation was stopped pending results of studies in hand on improved methods of maintenance and improved track structure.

379. On a reference being made, the Railway Board intimated: "There has been no adverse effect on track maintenance due to the freezing of the strength of gangmen. As a temporary measure, wherever conditions require greater attention, casual labour are engaged for a specific period when such attention is required and as a long range measure, methods of maintenance are being improved like introducing directed maintenance, measured shovel packing and mechanical maintenance. In addition the track standards on important routes are also being improved."

380. The matter was discussed with the Railway Board who expressed the view that assessment on the "modified formula" does result in high figures and assured us that the whole question of determination of gangstrengths will be reviewed.

381. We suggest that gangstrengths should be determined on a careful consideration of the following:—

- (i) Optimum standard of maintenance for each classification of track based on the maximum speed and traffic density;
- (ii) Schedule of work 'round-the-year' for the required optimum standard of track maintenance;
- (iii) Assessment of the requisite number of man-days, based on average out-turn of work for each operation per man-day, to conform to the specified 'round-the-year' schedule;
- (iv) Additional strength required to cover such factors as require extra attention, over and above the normal; and
- (v) The optimum length over which a given gangstrength can carry out effectively and without default every track maintenance operation.

382. *Track Maintenance*:—[Recommendations 101(i), 104(iii), 105(i), 107, 108 Part II]—"The Kunzru Committee expressed misgivings regarding the maintenance of track to specified standards. They suggested the measures listed below:—

- (i) Ballast deficiency to be made good.
- (ii) Periodical checking of versines and superelevation of curves.
- (iii) Work study of the various operations involved in manual packing.
- (iv) Standardisation of the mate's diary to contain the results of checks made by the permanent way inspector and instructions given by him.

383. Deficiency of clean ballast is manifest on many sections. The Railway Board have intimated that in the 5-year period, 1963-64 to 1967-68, procurement has been of the order of 5 million cubic metres per annum. This amounts to about 6 per cent of the ballast on the broad, the metre and the narrow gauge systems. In the normal course of maintenance, pulverisation of ballast takes place in 8 to 12 years depending on its quality. It does appear that greater efforts are called for to enhance the procurement from 5 to about 9 million cubic metres per annum. We note that the training-out capacity has been appreciably increased on the broad and the metre gauges. Hopper wagons for conveying ballast from quarries for distribution on the track have been increased from 466 as on 1-4-1962 to 2827 wagons as on 1-4-1968.

384. The Railway Board had issued necessary instructions to the Railways regarding periodical checks of curves and maintenance of 'Curve Registers'. Some of the registers which were examined by us fell short of expectations. It is necessary that curve-alignment register should embody the physical characteristics of each curve and the first 2 or 3 columns should contain the correct versine and superelevation figures against each "station". This measure would facilitate the P.W.I., to carry out local adjustments as necessary during periodical checks. The matter was discussed with the Railway Board, and we have been advised that appropriate instructions are being issued by the Board.

385. In regard to work studies pertaining to track maintenance operations, instructions were issued by the Railway Board to the Northern, the Eastern, the South Eastern, the Central and the Western Railways to undertake such studies. These studies were in respect of all permanent way maintenance jobs including through packing in connection with the proposed introduction of an incentive scheme for track maintenance. It has been indicated that the Board have recently taken a decision to defer the proposal of introducing incentive scheme and, consequently, the studies have been stopped.

386. The Railway Board intimated that the mate's diary has been replaced by the "Gang Inspection Register". We examined a bound foolscap-size register of one Railway and the instructions issued by the Chief Engineer for filling the register. These instructions require the P.W.I. to indicate the 'twist' in millimetres per metre, variations in gauge, versines and cant on curves, condition of rail joints, adequacy of packing and special remarks on condition of track components, protection equipment and gang tools. The Indian Railways Way & Works Manual embodies comprehensive instructions regarding methods of track maintenance and supervision. In our view, the replacement of the mate's diary by the "Gang Inspection Register" was quite unnecessary. The matter was discussed and we have been advised that the Railway Board have since issued instructions dispensing with the "Gang Inspection Register."

387. *Modernising methods of track maintenance*:—[Recommendations 105(ii), 155(i) Part II]—The Kunzru Committee had observed that the manual packing of the track, as practised on the Railways in India, has continued in its present form since the inception of railways in India. This practice has not materially changed by evolution over this long period. They added that what was being done at the present time was not sus-

ceptible of any great improvement. They referred to the study of the various methods of consolidation of track, viz. manual packing, shovel packing and machine packing, in relation to stability and strength of track and safety of operation.

388. The Railway Board in their comments have indicated that improved methods of track maintenance, i.e. measured shovel packing, directed maintenance, etc. are now being tried for adoption on a large scale.

389. Measured Shovel Packing: Measured shovel packing, confined to track laid with wooden sleepers or of wood joint sleepers on CST-9 or steel trough sleepered road, is being tried on an extensive scale on the Delhi-Howrah route and other sections. The Railway Board consider that this method has shown encouraging results.

390. The method was demonstrated to us by the R.D.S.O. at Lucknow. It involves the use of telescopic sights for alignment and 'dansometers' for assessing voids which are filled by graded metal under the wooden sleepers after jacking up the track.

391. Directed maintenance: We have also learnt that a system of maintenance called "Directed maintenance" is being evolved for use on the Railways in order to obtain maximum utilization of available manpower. The method is under trial over a length of 250 kilometres on the North Eastern Railway. Further trials are likely over a length of 300 kilometres each on the Northern, the Eastern and the South Eastern Railways.

392. It is true that trials have been undertaken lately but what is important is that the results of these trials should be assessed early so that the Railways may be in a position to modernise their methods of maintenance of permanent way.

393. Mechanised track maintenance: The Kunzru Committee expressed the hope that introduction of mechanised track maintenance would be expedited and appropriate action taken on procurement of spare parts and setting up of adequate repair facilities for the tampers approved for use.

394. The Railway Board have advised us that in the 5-year period 1963-64 to 1967-68, five on-track tamping machines were commissioned. The results were encouraging. Twelve more machines are being procured. One ballast cleaning machine has also been procured for trials which are being conducted. Two sets of "off-track" tie tampers manufactured in Ajmer Workshops, Western Railway, are being tried. Large scale production of such tampers will be considered on the results of trials. Necessary measures have been taken for procurement of spare parts of light/heavy "on-track" Matisa tampers and for provision of repair facilities on the Northern, the Eastern and the South Eastern Railways.

395. The use of "on-track" automotive tie tampers which correct longitudinal and cross levels and pack the track requires traffic blocks for which, we presume, no serious difficulty is experienced having regard to traffic density on trunk routes and main lines. We feel that the output of tie tamping and ballast cleaning machines, compared to the current manual methods, would justify their continued use.

396. *Hallade track recorder and track recording car*—[Recommendations 119, 121 and 155(ii) Part II]—The Kunzru Committee suggested that a minimum number of Hallade track-recording tests should be prescribed for trunk routes, main lines and branch lines and that the interpretation of Hallade charts by the operator-in-charge should be subject to competent checks periodically.

397. We understand that schedules, as specified below, are being followed by Railways:

- | | |
|------------------------------|------------------|
| (i) Trunk routes— | Every 4 months. |
| (ii) Main lines— | Every half year. |
| (iii) Branch and N.G. lines— | Every year. |

We have been advised that the Hallade charts are periodically scrutinised by senior officers of Railways to ensure their correct interpretation by the operator-in-charge.

398. We consider it necessary that the Assistant Engineer concerned should invariably be associated with the testing of the track by the Hallade track recorder and that the charts should be documented at the end of the day's run and defects listed for prompt action by sectional permanent way inspectors.

399. While the Hallade track recorder does indicate the extent of track defects in the lateral and vertical planes, defects on curves, pitching and rolling, the Amsler track recording car records track defects to dimensional accuracy. The Kunzru Committee therefore suggested that each Railway should be allotted a test car to enable track irregularities under load being measured.

400. The Railway Board have intimated that a prototype of the broad gauge Amsler track recording car is under manufacture, that 85 per cent of work has been done, and that after satisfactory trials, 5 additional cars for use on broad gauge and 3 new cars for use on metre gauge will be got ready.

401. We suggest that the construction and equipment of test cars should be completed on priority and that at least one test car for the metre gauge should be made available as soon as possible.

402. As regards track recording trollies, the Railway Board asked the R.D.S.O. only recently—in April 1968—to look into the question of their procurement in view of the running of high speed trains. It does not seem that earlier, any action had been taken on this part of the recommendation. The proposal, we understand, has since been given up.

Level Crossings

403. *Census at Level Crossings*:—[Recommendations 7(vi) Part I and 7(i)(c) Part II]—The Kunzru Committee, while reviewing the accidents at level crossings, had suggested that a census of traffic at all level crossings should be taken at least once in 5 years as a normal practice except in special cases where earlier action might be necessitated on account of any unforeseen development in the intensity of traffic. They had also suggested that if an accident takes place at an unmanned level crossing, a census should be arranged to determine if the level crossing requires to be manned.

404. From the replies sent by the Railways to our questionnaire, it transpired that there is no uniform practice in regard to taking of a census at level crossings. A few of the Railways have some kind of yardstick to determine whether C class unmanned level crossing should be manned or a particular manned level crossing should be upgraded. The others have no such yardstick. It appears that the Railway Board had originally provided some guidelines but later, in 1967, they issued further instructions to the effect that the existing local conditions should be taken into consideration and a decision taken in the matter on its merits by the Railways keeping in view the need for safety as well as the pressing need for economy.

405. It also seems that with the issue of Railway Board's instructions in 1967, some Railways started considering that no census need be taken at all. One of the Railways, in reply to our questionnaire, had stated that they had suggested to the Board that regular census at all railway level crossings once in five years was unnecessary and wasteful.

406. While we agree that it is not necessary to provide a rigid standard or yardstick, we do feel that some norm should be fixed for all Railways which may help them in deciding whether a particular unmanned level crossing should be manned and whether a manned level crossing requires upgrading. The Railway Administrations may have the discretion to depart from the norm in the light of local conditions on the merits of each case after taking into consideration the need for safety.

407. We had asked for information in regard to the number of instances in which as a result of the census taken at the level crossings following an accident, it had been found that a case existed for manning of the level crossing. In reply, the Railway Board advised us that in 39 such cases, it was found that the manning was justified. The information furnished to us in this behalf also shows that at least at 8 level crossings out of these, the last periodical census had taken place a year or less earlier. Of these 8 cases, there is a remark in respect of one that the result of the last periodical census showed that manning was justified but had been delayed. In respect of the others we presume that the census results had not justified the need for manning. Since the census taken after the accident revealed that there was need for manning, we are constrained to conclude that the census taken only a few months prior to the accident at these level crossings would have been of a routine nature not taken with due care. We are unable to believe that traffic—both road and rail—could have developed within the space of a few months to the extent that where no case existed for manning a few months before, manning became justified shortly afterwards. On one Railway where 8 instances of census taken at level crossings after the accident showed that there was need for manning, we have been advised that in 5 cases the results of the previous census had also indicated the need for manning but delays had occurred as the matter remained under correspondence with the State Governments. In the remaining 3 cases, it is not clear whether a periodical census had taken place prior to the accident and if so, with what results. Taking these facts into consideration we cannot help observing that it would indeed be unfortunate if the census at a level crossing were to be resorted to only in the event of an accident. We are of the view that the five-yearly census should not be given up.

408. *Railway Safety Works Fund*:—[Recommendations 7(v)—Part I and 7(iii)(a)—Part II]—The Kunzru Committee had recommended the establishment of a Railway Level Crossing Fund on the pattern of a similar fund on the Canadian Railways to finance all protective works at level crossings. They envisaged that the Fund would be credited with yearly contributions by the Ministries of Railways and Transport and by the State Governments on a basis to be determined by mutual consultation.

409. We have been given to understand that the Fund known as the Railway Safety Works Fund was started sometime ago. On the recommendation of the Railway Convention Committee (1965), an additional contribution of one per cent on the capital-at-charge of the railway is to be made to the general revenues by the Railways. Out of this additional contribution, a sum of Rs. 16.25 crores is to be paid to the States in lieu of the passenger fare tax and any sum in excess of this is credited to the Safety Works Fund. The total amount creditable to this Fund during the five years 1966-67 to 1970-71 is expected to exceed Rs. 9 crores. In fact, till 31-3-1968 a sum of Rs. 2.87 crores had already been credited to the Fund.

410. We were advised that there had been hardly any expenditure out of this Fund, primarily because the existing procedure for operation of the Safety Works Fund is cumbersome. The State Governments after formulating their programme annually for such safety works in consultation with the Railway administration are required to bear the expenditure of such works in the first instance. The amount is later reimbursed through their respective Accountants-General out of the grants-in-aid sanctioned by the Central Ministry of Finance. It seems that with such a procedure, the State Governments are not inclined to show any initiative in making use of the Fund particularly for manning of level crossings or their upgrading.

411. We had informal consultations with the Railway Board in this connection and find that about 10 per cent of this Fund would be sufficient to meet all the need for manning the unmanned level crossings or upgrading the manned level crossings for which justification exists. We suggest that some procedure should be evolved by which 10 per cent of the amount in this Fund should be earmarked for manning the unmanned level crossings and upgrading of the manned level crossings and the Railway administration should be authorised to draw directly from this Fund upto this amount for this purpose. Of course, care should be taken to see that the Fund earmarked for each State is used in that State only. We understand that steps are being taken in this regard by the Railway Board in consultation with the Ministry of Finance. We hope that a satisfactory procedure will be evolved whereby the funds available can be put to appropriate use.

412. We may add that the remainder of the Fund, i.e., 90 per cent should also be utilised to the best advantage by providing road overbridges or underbridges which would, undoubtedly, make for complete safety and help in reducing the number of level crossing accidents. For construction of such road overbridges and underbridges, the expenditure on the bridge portion and the approaches is shared by the Railways and the State Governments. According to the present procedure, the cost of the bridge proper upto a width of 24 feet is borne entirely by the Railway and the cost of any additional width of the bridge and of the approaches, by the

State Government. We understand that a proposal is already under consideration for sharing the cost of these on a basis whereby the total cost i.e. the cost of the bridge proper and of the approaches will be shared by the Railways and the State Governments on a 50-50 basis, the work being actually executed by the Railways within its premises and the Road Authority outside railway premises. We hope that in this too, a satisfactory solution will be evolved and the Fund utilised purposefully.

413. *Undulations and bumps on approaches to unmanned level crossings*—[Recommendation 57(ii) Part I]—The Kunzru Committee had suggested that approaches to unmanned level crossings should be provided with undulations or bumps so that fast moving road vehicles are obliged to reduce their speed while passing over them. The Railway Board advised us that some of the States have not agreed to this proposal and that the matter is under correspondence with the Ministry of Transport.

414. We do not consider that a measure of this nature would have any advantage. On the other hand, undulations on the approaches to such level crossings may at times result in heavy vehicles getting stalled at or near the level crossings. We, therefore, do not think this matter need be pursued further.

415. *Amendment to the Motor Vehicles Act in States*—[Recommendation 57(iii) Part I]—The Kunzru Committee had urged the State Governments to enact a law making it obligatory for drivers of passenger buses before passing unmanned level crossings to stop and to cross them with the conductor walking ahead of the bus.

416. We have been advised that the State Governments have agreed to incorporate such provisions in their statute and made the necessary changes in the Motor Vehicles Act. We consider this a wise provision and hope that violations of this provision of the law would be sternly viewed and the offenders brought to book.

417. *Posting of persons suffering from physical handicaps as gatemen*—[Recommendation 7(i)(b)—Part II]—The Kunzru Committee had warned against posting of physically handicapped persons as gatemen. In an emergency a gateman is required to show considerable alertness and alacrity and to run speedily towards an oncoming train to warn it of the obstruction at the level crossing. A physically disabled gateman would be unable to discharge his duty in such an eventuality.

418. The Railway Board have advised us that physically handicapped gatemen have been replaced on almost all the Railways. The improvement effected in the percentage of level crossing accidents at manned level crossings ascribable to railway staff to which we have already made reference in Chapter-II, we trust, is partly on account of this factor. We presume that on replacement, these men were absorbed in alternative suitable employments and that such disabled persons would continue to be so employed on compassionate grounds if found suitable.

419. *Interlocking of level crossing gates with signals*:—[Recommendation 7(iii)(b)—Part II]—The Kunzru Committee observed that one of the measures to improve safety at level crossings was to interlock the gates with signals. They found the progress of interlocking level crossing gates with signals unsatisfactory during the Second Five Year Plan and recommended that the pace should be accelerated.

420. The Railway Board have advised us that the Railways had been asked to accelerate the work of interlocking of level crossing gates and to ensure that the work in respect of all "special" and "A" class level crossings situated within and outside station limits and "B" class level crossings on suburban sections should be completed on a high priority basis during the Third Five Year Plan.

421. The position furnished by the Board regarding the progress of interlocking of level crossing gates subsequent to the Kunzru Committees' recommendation is as under:—

Railway						Number of works planned	Number of works remaining to be completed
Central	..	..	..	..	..	9	5
Eastern	..	..	..	..	..	119	81
Northern	..	..	..	..	..	63	1
North Eastern	..	..	..	..	..	119	20
Northeast Frontier	..	..	..	..	..	27	..
Southern	..	..	..	..	..	34	3
South Central	..	..	..	..	..	13	12
South Eastern	..	..	..	..	..	..	..
Western	..	..	..	..	..	5	..
Total	..	..	..	..	..	389	122

422. We find that 30 level crossings i.e. 4 "Special" class, 17 "A" class and 9 "B" class, have been dropped from the programme originally drawn by the Eastern Railway. It has been stated that the 17 "A" class level crossings are to be provided with warning bells instead of interlocking their gates with signals. The "Special" and "B" class level crossings according to the Railway Board are not in need of interlocking as they are located in goods yards and in mill sidings where rail traffic is meagre. We consider that the basic object of interlocking level crossing gates with signals is to ensure that a train or any other rail movement will not come over the level crossing till the gates are closed to road traffic. Thus, the aim of interlocking level crossing gates with signals, is the safety of road traffic and it should be provided where the road traffic is heavy. We also do not subscribe to the view that the measure of safety provided by the installation of warning bells is as good as that obtained by interlocking gates with signals.

423. We find, even after giving an allowance for the works that were dropped, that 24 per cent of these works still remain to be completed. The Railway Board had directed the Railways that the works should be completed during the Third Five Year Plan on a high priority basis. The Third Plan ended more than two years ago. The Board's directive therefore seems to have gone partly unheeded.

424. *Automatic half-barriers*—[Recommendation 7(iii)(c)—Part II]—The Kunzru Committee had suggested that determined and energetic steps to evolve efficient and fail-safe automatic barriers to suit Indian conditions should be taken. They had also suggested investigation by the R.D.S.O. into the subject of provision of suitable types of bells and red flasher signals.

425. In their remarks, the Railway Board had favoured the installation of automatic half barriers which are actuated by the passage of a train over a pre-determined point. The Board considered that in the absence of a gateman who normally controls traffic, vehicles may get trapped if the gates are provided with full barriers, whereas in the case of half barriers the vehicles which happen to be on the railway track when the gate is closed can go out. They also stated that the Central, the Eastern, the Northern and the Southern Railways had been asked to undertake trials with automatic half barriers and that the work was in progress.

426. We had asked the Railway Board if the possibility of the road users digressing from the queue traffic and winding their way through the open half of the level crossing barrier and thereby jeopardising their own safety as well as that of the train had been taken into consideration before taking a decision on installation of such automatic half barriers. We were advised that the Board were aware of the possibility and that arrangements to educate the road users about the hazards involved in winding their way through the open half of the barrier would be made and that if considered necessary, small raised and proudded blocks with a height of 6" to 1" may be fixed in the centre of the road on approach to the level crossing for an adequate distance on either side to prevent the road user from zig-zagging his way through the barrier.

427. The working of the automatic half barrier was demonstrated to us by the R.D.S.O. at Lucknow. In the evidence tendered before us, it was stated that early next year an automatic half barrier would be installed on Northern Railway at a level crossing in New Delhi and that for some time the level crossing would continue to be manned. Similarly automatic half barriers, we were advised, would be installed shortly in the Calcutta area on the Eastern Railway and near Faridabad on the Central Railway.

428. In our meeting with the Railway Board, however, we were advised that the Board do not consider the automatic half barrier suitable for Indian conditions and that the experiment may be taken as no longer alive. We hope to revert to this in the second part of our Report.

429. In regard to the Kunzru Committee's recommendation for providing suitable type of bells and red flasher signals on both sides of the unmanned level crossings to warn road vehicle drivers of the approaching train, this suggestion does not appear to us to be of much practical value. It is desirable that the responsibility for avoiding accidents should rest on road users in the case of unmanned level crossings. This responsibility will be diluted by the provision of bells and red flasher signals without any advantage in the conditions prevailing here. We doubt very much whether road users who seem, as seen from the figures of accidents, to be getting more and more rash would mind the warning for they may take the risk of getting through before the train arrives in spite of the warning. We would not therefore advocate installing of bells and red flasher signals as it would result in unnecessary waste of money without comparable advantage in the matter of avoiding accidents in our conditions.

Signalling

430. *Implementation of Signalling and Interlocking Programmes—* Recommendation 83(v)—Part II]—The Kunzru Committee, as a result of their review of the various signalling and interlocking programmes having a bearing on safety, observed that though the planning of these works had been on a modest scale, their implementation had been inadequate and unsatisfactory. The Kunzru Committee had suggested that all such works sanctioned in the Second and the Third Five Year Plans should be completed by the end of the Third Plan.

431. The Railway Board had stated that all signalling and interlocking works brought forward from the Second Five Year Plan and those included in the works programmes during the first three years of the Third Five Year Plan would be completed by the end of the Third Five Year Plan.

432. The information furnished by the Railway Board shows that the total number of works brought forward from the Second Five Year Plan and of those programmed in the first three years of the Third Five Year Plan was 808 of which, at present (i.e. in 1968), 113 works are outstanding, viz. 8 of the Second Five Year Plan and 105 of the first three years of the Third Five Year Plan. The assurance given by the Railway Board has thus not been completely fulfilled.

433. It has been stated that the delay in completion of these works is unavoidable in an Organisation like the Railways where a large number of works are required to be carried out under traffic conditions and signalling and interlocking works are to be dovetailed with yard remodelling and other line capacity works. It has been further indicated that delay in release of foreign exchange and supply of materials by Messrs Indian Telephone Industries and Bharat Electronics Limited, Bangalore also resulted in delay in completion of the works in some cases.

434. As for the reasons given for the delay in the execution of the works, we cannot help remarking that the factors enumerated cannot be deemed as unanticipated or such as could not be visualised, at the time of planning and programming these works. That apart, however, it should be well within the means of an organisation like the Railways to accelerate the pace of these essential safety works.

345. *Provision of rudimentary interlocking at non-interlocked stations—* [Recommendations 9(i)(g) and 83(iii)—Part II]—The Kunzru Committee had recommended that all stations on the broad and metre gauges should be provided with rudimentary interlocking in a year's time and in the case of narrow gauge stations, on those sections where the density of train service is more than three trains each way should also be provided with rudimentary interlocking within a reasonable period.

436. The Railway Board stated that the Railways had been asked to complete the work of providing rudimentary interlocking on the stations on broad and metre gauges by 31-3-1964 and the work in the case of stations on the narrow gauge was to be taken up on a programmed basis on sections which were likely to be retained and on which the train services were more than three trains each way. The Railways had been directed that the work on such stations on the narrow gauge should be completed in the shortest possible period.

437. The information furnished by the Railways shows that there are still a number of stations on broad and metre gauges which have not been provided with rudimentary interlocking. The position as it emerges from this information is shown below:—

TABLE 61

Railway	Number of stations not provided with rudimentary interlocking		
	B.G.	M.G.	Total
Central	..	..	..
Eastern	6	..	6
Northern	..	..	..
North Eastern	..	24	24
Northeast Frontier	6	57	63
Southern	1	7	8
South Central	..	..	..
South Eastern	12	..	12
Western	2	14	16
All Railways	27	102	129

438. It will be seen that 129 stations on the broad and metre gauges put together were without rudimentary interlocking on 31-3-1968. Almost 50 per cent of these were on the Northeast Frontier Railway.

439. The Railway Board has indicated that 196 stations on the narrow gauge were on the sections where more than 3 trains run each way. Of these, dispensation from provision of rudimentary interlocking was given for 57 stations by the Railway Board. Of the remaining, 110 were provided with rudimentary interlocking upto 31-3-68. We hope that this safety provision will be completed at the other stations in a short time.

440. *Provision of lock and block on double line*—[Recommendation 83(ii)—Part II]—The Kunzru Committee recommended that lock and block instruments should be provided on all double line sections in about a year's time. The Railway Board accepted the recommendation and indicated that instructions had been issued to complete the work of providing lock and block instruments at the latest by February, 1965.

441. We find that 43 stations, i.e. 15, 3 and 25 stations on the Eastern, the Northern and the South Central Railways respectively were not provided with block instruments at the end of 1967-68.

442. It is also noticed that, at the end of 1967-68, another 360 stations had this safety device in block working only partially i.e. block instrument with control on last stop signal only and not complete lock and block working. Of these 360 stations, 231 and 90 stations were on the South Eastern and South Central Railways respectively.

443. We feel that this recommendation should have been fully implemented long ago in the interests of safety.

444. *Multiple Aspect Signalling*—[Recommendations 55(iv)—Part I and 83(iv)—Part II]—The Kunzru Committee laid great stress on the provision of multiple aspect signalling of the upper quadrant or colour light type in order to minimise the possibility of a driver overshooting a signal and to eliminate the risk of drooping signals. They suggested that not only should the work in hand be completed early but a more progressive policy of extending multiple aspect signalling on all the main line sections should be implemented on a programmed basis.

445. The Railway Board have observed that Railways had been asked to provide multiple aspect signalling of the upper quadrant or the colour light type, as may be suitable, on the trunk routes on a programmed basis consistent with the availability of funds.

446. The information furnished by the Railway Board shows that the number of stations programmed to be provided with multiple aspect signalling of one type or the other was 1,320 on 31-3-1964 of which 537 stations had been so far provided. In other words, only 41 per cent of the programmed work has thus far been completed.

447. *Provision of modern electrical signalling*—[Recommendations 14(iii), 84(ii), (iii) & (iv)—Part II]—The Kunzru Committee observed that the provision of signalling on the Railways continued to be archaic in conception, lacked boldness in planning and was halting in execution. They found the signalling inadequately equipped to face the new demands of safety and better movement on Indian Railways and considered the adoption of modern electrical signalling, such as colour light signalling, automatic block system, power signalling route relay interlocking, etc., both essential and inescapable.

448. The Railway Board in their comments observed that the provision of colour light signalling on A.C. electrified double line sections was already the accepted policy and would be extended to A.C. electrified single line sections. They further added that all stations on the D.C. electrified suburban sections were either provided with or were programmed for colour light signalling. While giving the factual position, the Board indicated that 54 stations on single line A.C. electrified sections, viz., 34 on the Eastern Railway, 16 on the Southern Railway and 4 on the South Eastern Railway remained to be provided with colour light signalling. As regards route relay interlocking, it was stated that the Railways had been asked to keep the Kunzru Committee's recommendation in view while making proposals for signalling works in the future works programmes. Regarding automatic block signalling, the policy was to assess the comparative advantages of providing automatic block signalling vis-a-vis provision of additional lines whenever the anticipated increase in intensity of train services indicated the need for enhanced capacity.

449. We have within the limited time at our disposal surveyed briefly the efforts of the Railways to go in for the increasing use of modern techniques of signalling. The information furnished by the Railways shows that of the 6,160 block stations on the Indian Railways, only 134 stations are provided with colour light signals. Over 122 of these stations, trains are worked on Automatic Block System and over another 36 stations, on Centralised Traffic Control. We also find that during the last five years, 16 stations were provided with power signalling and 30 stations with route relay interlocking.

450. We consider these achievements inadequate in view of the increasing speed and density of traffic. There are, at present, 4,256 stations equipped with lower quadrant two-aspect semaphore signals without pre-warning for the first stop signal of the station. This pre-warning, the Kunzru Committee had considered desirable particularly on sections where trains are booked to run at high speeds. The recommendations of the Kunzru Committee assume urgency with the increasing introduction of diesel and electric traction and running of heavier trains at higher speeds. We urge that special efforts should be made to accelerate the progress in the use of modern signalling techniques.

451. *Track Circuiting*—[Recommendation 84(i)—Part II]—The Kunzru Committee recommended that track circuiting should be provided extensively and obstacles like shortage of wooden sleepers or non-availability of concrete sleepers should be overcome.

452. The Railway Board in their comments observed that steps were being taken to surmount the obstacles and track circuiting would be provided to the maximum extent feasible.

453. It has been further indicated by the Railway Board that there are 1,700 stations on the trunk routes which are to be provided with track-circuiting of run through main lines. The progress of track circuiting reception lines of stations is as under:—

TABLE 62

Year						Number of stations at which work completed	Total number of stations provided with track circuiting by the end of the year
1963-64	..	..	..	..	..	13	178
1964-65	..	..	..	..	..	13	191
1965-66	..	..	..	..	..	34	225
1966-67	..	..	..	..	..	192	417
1967-68	..	..	..	..	..	126	543
Upto 31-8-68	..	..	..	..	..	32	575

454. It will be seen that the number of stations provided with track circuiting so far is 575. Out of these, 113 stations are on other than the trunk routes. In other words, only 462 stations i.e. 27 per cent of the 1,700 stations have been track circuited on the trunk routes.

455. The Railway Board have advised that they propose to complete the track circuiting of main lines at the remaining 1,238 stations on the trunk routes by 1973-74 at the rate of 200 wayside stations per year.

456. We note that the rate of progress of track circuiting so far has been slow. Judging from the performance of the last five years, it is obvious that unless energetic steps are taken to improve the pace of execution of track circuiting works the target of 200 stations per year may not be achieved. Needless to say the introduction of track circuiting at stations is an important step towards ensuring safety in train working.

457. *Automatic Train Control*:—[Recommendations 85 and 155(vii)—Part II]—The Kunzru Committee observed that with the speeding up of trains on the trunk routes of the Railways to meet the present day requirements there was need for ensuring automatic obedience by the engine crew to the respective indications exhibited by the signals enroute. This is provided for by Automatic Train Control. This system gives audible and visible warning to the driver in the cab of the engine when the signal is showing danger aspect and should the driver fail to acknowledge the warning, the brakes apply automatically bringing the train to a stop before the signal. The Kunzru Committee expressed dissatisfaction with the progress made in adopting this equipment for use under Indian conditions and urged early initiation of research in this regard. They also suggested introduction, as an experimental measure, of cab signalling which provides the driver with a replica of the aspect of the signal on a screen in the cab of his engine.

458. We examined the progress made in regard to adoption on the Indian Railways of Automatic Train Control which has been in use on the Railways in advanced countries for a long time. We have been advised that the provision of Automatic Train Control is expected to be completed in stages on the Howrah-Burdwan, Burdwan-Gaya and Gaya-Mughalsarai sections by March 1970. In addition, it is being planned for suburban sections in Calcutta and Bombay areas and later, on other trunk routes.

459. It would seem that the system would be under trial on these nominated sections for at least a year. It would, therefore, be reasonable to conclude that a couple of years will elapse before the reliability of the system is tested and results known. The progress of efforts towards the adoption of Automatic Train Control on which the Kunzru Committee had laid stress has, thus, in our view been slow.

460. We were advised that a part of the equipment in the installation of Automatic Train Controls has, at present, to be imported but that certain signalling firms in India would be ready to set up indigenous capacity for manufacture of the equipment in collaboration with their principals in United Kingdom and Germany once the system gets into stride. We feel that had the trials and installation of Automatic Train Control been initiated earlier, these firms would have become interested in this field of manufacture already. We propose to advert to this subject in Part II of our Report.

461. *Failures of signalling and interlocking gears*:—[Recommendation 86—Part II]—The Kunzru Committee surveyed the failures of signalling and interlocking gears on the Indian Railways for the years 1960-61 to 1962-63. They observed that the failures on all Railways generally and on a few Railways in particular had been increasing. They also found substantial shortfalls in the overhauling and replacement of lever frames and block instruments.

462. The Railway Board stated that the Railways had been asked to take special measures to clear the shortfalls in the overhaul and replacement of lever frames and block instruments and to confirm that there were no arrears. The Board further indicated that the recommendation had been fully implemented on all the Railways except the North Eastern, the South Central and the Eastern Railways on which it was in the process of implementation.

463. We have examined the failures of signalling and interlocking gears and block instruments for the last five years in continuation of the preceding three years:

TABLE 63

Year	Failures of signalling and interlocking gears		Failures of block instruments	
	Number	Incidence per million train kms.	Number	Incidence per million train kms.
1960-61	34,520	..	19,871	..
1961-62	37,720	..	21,255	..
1962-63	38,210	..	20,134	..
1963-64	30,014	72.41	12,257	29.57
1964-65	30,613	71.92	12,618	29.64
1965-66	31,875	72.58	16,447	37.45
1966-67	34,433	77.60	17,153	38.66
1967-68	35,944	80.55	15,203	34.03

464. It would appear that the incidence of failures of signalling and interlocking gears has, after a marked decrease in 1963-64, been steadily increasing every year. The same pattern is discernible in case of failures of block instruments where, however, a welcome reversal of the trend is noticed during 1967-68.

465. The incidence of failures of signalling and interlocking gears and block instruments on the different railways during the last five years is given in Annexures LXXV and LXXVI. It will be seen that the failures in respect of both signalling and interlocking gears and block instruments correlated to the intensity of train services were the heaviest on the North Eastern Railway.

466. We have also examined the failures of track circuits during the last five years. The incidences of such failures and the number of track circuited stations during these years are shown below:—

TABLE 64

Year	Number of track circuit failures	Number of track circuited stations
1963-64	1,556	178
1964-65	1,946	191
1965-66	2,164	225
1966-67	3,398	417
1967-68	3,762	543

467. The increasing trend in the failures of track circuits, it would be observed, is outstripped by the increase in the number of track circuited stations during the five years. While the number of such stations have increased by about two hundred per cent, the number of failures have risen by about 140 per cent. Some improvement in the position is thus indicated. We would, however, like to remark that track circuits are an important aid to safety in railway operation. We would therefore urge that efforts to reduce their failures to the maximum extent possible should be intensified. The incidence of track circuit failures on the different Railways is given in Annexure LXXVII. The Annexure shows that the Northern Railway has been consistently having the highest number of track circuit failures during the last four years.

468. We have also surveyed the position about the overhauling and the replacement of lever frames and block instruments at stations. The shortfalls in the overhauling and replacement programmes are shown below:—

TABLE 65

Year	Lever frames		Block instruments		
	Shortfall in overhaul	Replacement of worn-out frames	Shortfall in overhaul	Replacement of worn-out instruments	
1963-64	645	113	438	26
1964-65	947	117	589	37
1965-66	364	87	288	27
1966-67	272	46	218	27
1967-68	254	22	155	51

469. The shortfall in overhauling programmes in respect of both lever frames and block instruments is being progressively reduced but it is still substantial. While the shortfall in the replacement of worn out frames during 1967-68 was considerably less than in the previous years, the number of worn out block instruments in need of replacement during 1967-68 was the highest in the past five years. The shortfalls on the different Railways are given in Annexure LXXVIII. It would appear that the backlog in the overhauling of frames and block instruments is the heaviest on the South Central and the North Eastern Railways respectively. It is noteworthy that the whole of the backlog in the replacement of worn out block instruments is confined to the Northern and the Southern Railways; on the Northern Railway it has been there all the five years. Curiously, in their replies to the questionnaire almost all Railways had indicated that they were carrying out the overhauling of lever frames and block instruments and that there was hardly any backlog in this regard.

470. The Kunzru Committee had observed that in order to ensure a better standard of maintenance and operation of the signalling equipment, there was need for prescribing a yardstick for augmenting the strength of the inspecting and other staff concerned with the maintenance and upkeep of signalling and interlocking equipment. The Railway Board have in their comments on the Kunzru Committee's recommendation No. 188 indicated that the strength of signal inspectors was being determined on the basis of lever units. Nothing had however been said about the yardstick for other staff i.e. the block, electric or mechanical signal maintainers who actually have to maintain the block and signalling gear.

471. Some of the Railways in reply to the questionnaire have indicated that difficulties are experienced in observing the schedules for overhauling of lever frames and block instruments due to the non-availability of requisite staff or inadequate time allowance, absence of rational approved yardsticks for workload of signal inspectors, etc. We stress the need for clearing the shortfalls in the overhauling and replacement programmes for lever frames and block instruments, investigating the factors responsible for failures of signalling and interlocking gears and laying down a yardstick for determining the strength of block, electric and mechanical signal maintainers.

Rolling Stock

472. *Maintenance of locomotives*:—[Recommendations 125(i) to (vi)—Part II]—The Kunzru Committee suggested the following improved methods in locomotive workshops and loco sheds:—

- (i) There should be cent per cent load deflection tests of springs.
- (ii) Workshops should be equipped with pyrometers, modern scrag and load deflection testing equipment.
- (iii) In all workshops, axles should be tested by ultrasonic equipment and that this facility should be progressively extended to loco sheds.
- (iv) Loco sheds should have an adequate number of deep drop pits and proper hoisting arrangements.
- (v) Journals running hot should be stamped with a star so that they are given closer examination while passing through loco sheds and workshops.
- (vi) The practice followed by some railways of providing pyrometer sticks to drivers of mail, passenger and through goods trains should be extended to all railways.

473. We have been informed by the Railway Board that—

- (i) Locomotive springs are being given cent per cent scrag and load-deflection tests, for which the necessary equipment has been provided in all workshops except on the Northeast Frontier Railway where a load deflection testing machine is being procured.
- (ii) Railways have provided pyrometers for the furnaces and quenching media for springs manufactured by highly skilled artisans known as springsmiths.
- (iii) Testing of all locomotive axles with ultrasonic equipment is carried out in all railway workshops except on the Northeast Frontier Railway where due to shortage of equipment, YP and YG engines only are subjected to such tests.
- (iv) Ultrasonic testing of locomotive axles is done in all loco sheds except those on the South Eastern, the South Central, the North Eastern and the Northeast Frontier Railways, where due to shortage of equipment, such tests are confined to axles of passenger locomotives. Additional equipment for the four Railways is being obtained on programmed basis.

- (v) All loco sheds have been provided with deep drop pits and hoisting arrangements except at Dornakal on the South Central Railway, where the work is in progress.
- (vi) The suggestion to stamp journals running hot with a star is considered undesirable as the chiselled mark would need effacing after the journal is satisfactorily attended to.
- (vii) Pyrometer sticks are in short supply as bismuth, one of its components, is an imported item.

474. *Organisation in Workshops*—[Recommendations 132(i) to (v)—Part II]—The Kunzru Committee made certain suggestions to strengthen the organisation in locomotive workshops. These comprised independent quality control organisation, adequate tests of important items, engines after periodical overhaul to be tested by an organisation independent of the workshops, and to be sent on preliminary trial with the driver from the workshop to enable repairs being carried out before it is sent on full trial.

475. It has been intimated to us that adequate action has been taken regarding the suggestions. The normal practice is to carry out trials by drivers independent of the workshops. We suggest that the final trial of an overhauled locomotive should be carried out as far as possible at a speed 5 to 10 per cent higher than the maximum permissible speed authorised for the particular type of locomotive, and a speedometer used for the purpose.

476. *Examination of locomotives*—[Recommendations 127(i) to (vii)—Part II]—The Kunzru Committee stressed the need for better supervision in loco sheds of incoming and outgoing locomotives, adherence to maintenance schedules, adequate facilities for examination, analysis of 'repeated bookings' by drivers, and test checks by inspecting officers. They also suggested remedial action after careful analysis of each case of engine failure.

477. We have been advised that engine examination is done by the chargemen and highly skilled fitters under the supervision of the foreman of the shed. Fitters for the job are literate enough to read entries in the repair books and record the repairs carried out. On a directive issued by the Railway Board on the maintenance of 'repeated-bookings' registers, each railway has standardised the form in which repeated bookings are maintained so that follow-up action is ensured.

478. *Brake Power and Braking Distances*—[Recommendations 55(i)—Part I and 6(iii) (c)—Part II]—The Kunzru Committee had observed that inadequate brake power may be a contributory factor in derailments and suggested expeditious conclusion of the experiments undertaken by the R.D.S.O. so that more powerful and effective brakes may be provided on trains.

479. The R.D.S.O. had carried out detailed investigations and suggested modifications to the following:—

- (a) Protruding nipples.
- (b) Ball valves.
- (c) Rolling rings.
- (d) Hose pipe cages.

480. The Railway Board have advised us that to improve the total brake power on goods trains, the percentage of effective brake cylinders has been increased from 75 to 85 on the broad gauge.

481. At the R.D.S.O. we inspected the working of the QA/QR (quick action-quick release) valves which have been fitted to a number of wagons. Their use will be extended after the results of field trials are known.

482. The Kunzru Committee suggested that braking distance trials should be carried out at speeds with various loads to determine the sighting distance of signals with a view to resite these as necessary.

483. The R.D.S.O. have conducted braking distance trials on the broad gauge for both passenger and goods trains on sections with negligible grades. The results were as below:—

Broad gauge (level track)—Goods—A train consisting of 70 fully loaded 4-wheeler wagons operating with a maximum speed of 72 km.p.h. can be stopped in emergency braking distance of 1,400 metres provided average vacuum on the train is not below 450 mm and 85 per cent of the brake cylinders on the train are effective. Passenger train consisting of 14/16 coaches operating with a maximum speed of 96 km.p.h. can be stopped in emergency braking distance of 1,000 metres provided average vacuum on the train is not below 495 mm and 90 per cent of the brake cylinders on the train are effective.

484. The Railway Board have issued instructions to the Railways that in addition to the sighting board at 960 metres in rear of the first stop signal, a second sighting board with a distinct design for goods trains should be provided at 1,400 metres in rear of the first stop signal on sections where broad gauge goods trains run at 72 km.p.h. We have been informed that trials are in hand on the metre gauge. It is suggested that trials for graded sections on the broad gauge and for level and graded sections on the metre gauge should be carried out without delay.

485. We further suggest that the distance between the distant and the first stop signals on high speed routes and the length of the signalling section in automatic signalling territory should not be less than the emergency braking distance.

486. *Speedometers and speed recorders*:—[Recommendations 53(i)(ii)—Part I]—The Kunzru Committee had recommended that speed recorders on the engines of all mail and express trains and speedometers on all those working passenger trains should be provided within a period of two years and later on, speedometers should also be provided on the engines working fast goods trains having a speed of more than 30 miles per hour, or running on sections with heavy gradients and sharp curves. They also urged that **early steps should be taken for creating adequate indigenous capacity** for the manufacture of speed recorders and their spare parts, preferably in a central workshop on the Railways. They added that adequate arrangements for proper maintenance and repairs of speedometers and speed recorders in service should be made on the Railways.

487. The Railway Board have advised us that V.D.O. speedometers and speed recorders which have been standardised for use on the Indian Railways are being manufactured by M/s International Instruments (P) Ltd., Bangalore. This firm has been able to meet the Railways' requirements of speedometers and speed recorders. All electric and diesel engines

are fitted with speedometers. Some difficulty has, however, been experienced in providing this equipment on some of the diesel locomotives recently turned out by the Diesel Locomotive Works, Varanasi due to the trouble with the gear box. The design of this has since been revised and the equipment will now be fitted on those locomotives which have been turned out without it.

488. The Railway Board have stated that speedometers on locomotives working goods trains booked at a speed of more than 30 miles/(50 kilometres) per hour on the broad gauge and on certain selected graded sections on the metre gauge, shall be provided in the second phase of the programme.

489. We are unable to subscribe to the view expressed by the Kunzru Committee that the provision of speedometers on locomotives working goods trains should depend on the speed of train or the difficult nature of a specific section. We consider a speedometer to be an essential safety aid for the driver and hold the view that all locomotives working trains should be equipped with speedometers since every driver working a train is required to observe some speed limit or the other. During the course of our discussions with the Railway Board, we were given to understand that the policy of the Railway Board is to instal speedometers on all engines, excluding shunting engines. We consider it to be a step in the right direction. We realise that the work of providing speedometers has to be carried out on the basis of a phased programme but it is essential that a target should be laid down in regard to the provision of this aid on all locomotives.

490. We understand that arrangements exist with M/s International Instruments (P) Ltd., Bangalore for the supply of spare parts and for the maintenance of speedometers and speed recorders and that maintenance facilities have also been developed on the Railways. We, however, wish to emphasise that the staff in the sheds should be educated and trained in maintaining the speedometers and speed recorders. We mention this particularly because of the fact that though the speedometers and speed recorders are scheduled to be overhauled at an interval of six months, we learnt during our visit to the Loco Workshop, Northern Railway, Lucknow that about 40 per cent of the speedometers were being received in that Workshop for repairs in damaged condition even before they were due overhauling probably due to mishandling.

491. *Engine Failures*—[Recommendation 126—Part II]—The Kunzru Committee observed that engine failures were a valuable pointer to the standard of maintenance in loco sheds. An engine failure is caused either by some defects in its parts or by the bad management of the engine crew resulting in their not being able to keep to scheduled timings on the run. The Kunzru Committee added that the engine failures which are a reflex of the maintenance practices followed in the sheds could be considerably reduced by proper analysis and appropriate action taken on each failure at all levels. The engine failures resulting from mismanagement by the crew indicated the obvious need for training and instructions to the engine crew and guidance and check on their working. They suggested that a handbook containing useful information about the defects likely to be encountered by the drivers on the run should be supplied to the drivers.

492. The Railway Board have stated that the recommendations have been implemented. They have advised us that all possible steps are being taken by the Railways to minimise the incidence of engine failures. The Railways have drivers' handbooks and relevant directives are given to the drivers from time to time.

493. We have compared the position of engine failures on the different Railways against the targets laid down by the Railway Board during the five years of our study. The number of failures of steam engines on each Railway and the kilometres per engine failure are given in Annexure LXXIX. It will be observed from the Annexure that on the broad gauge during 1967-68, the majority of the Railways were unable to achieve the target. The performance on the Western, the Eastern and the Southern Railways was much below the target, the kilometres per engine failure on these Railways being only 1,27,000, 1,30,642 and 1,55,989 respectively against the target of 2,00,000 kilometres laid down by the Board. We also notice that the position on these Railways considerably deteriorated in 1967-68 as compared to the previous year.

494. On the metre gauge also, the majority of the Railways could not achieve the target in 1967-68. The performance on the Central, the North-east Frontier and the North Eastern Railways was much below the target, the kilometres per engine failure on these Railways were 1,51,000, 1,55,000 and 1,59,044 respectively against the target of 2,00,000 kilometres. The deterioration in position on the Northeast Frontier and the North Eastern Railways was more pronounced during 1967-68 as compared to the previous year.

495. We have examined the main causes leading to failures of steam engines under the following heads, namely:—

(a) In sheds—

- (i) Bad workmanship, and
- (ii) Mismanagement by engine crew.

(b) In shops—

- (i) Defective material; and
- (ii) Bad workmanship.

The contribution of each of these factors to engine failures on the different Railways has been brought out in Annexure LXXX. It will be observed that during the last five years nearly 67 per cent of the engine failures on the broad gauge and 70 per cent on the metre gauge were caused by bad workmanship in sheds and mismanagement of the engine crew.

496. *Failures of diesel and electric engines:*—The kilometrage per diesel engine failure during 1967-68 on some of the Railways was about 1.2 lacs on the broad gauge and about 69 thousand on the metre gauge. The largest number of diesel engine failure were due to defective material on both the gauges. The kilometrage per electric engine failure during 1967-68 on the Eastern, the Northern and the South Eastern Railways were 82,397, 31,974 and 1,08,996 respectively. These performances are obviously on the low side. The need for efforts to improve the performance of diesel and electric engines is, thus, clearly indicated.

497. *Drivers handbooks*—We have checked the drivers' handbooks in use over the different Railways. We find that the handbooks for drivers in use on the Eastern and the Northern Railways do not contain information about defects likely to develop on engines on the run. These merely contain extracts from General and Subsidiary Rules. The Northeast Frontier Railway has yet to bring out a handbook for the drivers.

498. *Overaged locomotives*—[Recommendation 129—Part II]—The Railway Board have prescribed a life of 40 years for different classes of steam locomotives. Those which exceed this limit and are in operation are termed "overaged". The Kunzru Committee had examined the position in regard to overaged locomotives and had observed that the lowest figures of engine miles per engine failure were usually yielded by the overaged locomotives. They had recommended that special attention should be given to overaged locomotives and that suitable instructions to this effect should be issued by the Railway Board. The Railway Board have stated that suitable instructions have been issued to the Railways.

499. The position regarding overaged locomotives on the broad and the metre gauges at the end of the First, the Second and the Third Five Year Plans and as on 31-3-1968 was as follows:—

TABLE 66

Gauge		At the end of the First Plan (as on 31-3-56)	At the end of the Second Plan (as on 31-3-61)	At the end of the Third Plan (as on 31-3-66)	As on 31-3-68
1. <i>Broad gauge</i> —					
(a) Number	..	1,920	1,670	1,884	1,395
(b) Percentage	..	33·2	25·38	28·47	22·3
2. <i>Metre gauge</i> —					
(a) Number	..	765	691	606	520
(b) Percentage	..	25·8	18·9	16·77	14·5

500. It would be observed that the number of overaged locomotives on the broad gauge and the metre gauge showed a decrease at the end of 1967-68. As for overaged locomotives on the narrow gauge, we have already dealt with the subject in Chapter II of this Report.

501. We have examined the performance of overaged locomotives on the different Railways during the last five years. From the information received from the Railways we find that the performance of overaged locomotives on the broad gauge has been satisfactory on all the Railways except the South Eastern Railway. On this Railway, the average kilometrage per overaged engine failure ranged between 1,00,602 and 1,60,034 during the first four years. Happily, however, the performance improved in 1967-68 and exceeded the target of 2,00,000 kilometres per engine failure laid down by the Railway Board for all engines.

502. On the metre gauge, the average kilometrage per overaged engine failure has been extremely low on the North Eastern and the Western Railways throughout the period under study. On the former, the performance ranged between 26,074 and 35,860 kilometres per overaged engine failure, and on the latter between 30,000 and 1,15,527 kilometres per overaged engine failure against the target of 2,00,000 kilometres per engine failure for all engines. It is evident that overaged locomotives on the metre gauge need further attention in maintenance in order to improve their performance.

503. *Carriage and wagon maintenance*:—[Recommendations 134(ii) to (v), 135(i) & (ii)—Part II]—The Kunzru Committee had suggested the following measures for improved maintenance of springs of carriages and wagons:

- (i) pyrometers and circulating quenching media at controlled temperature should be provided;
- (ii) adequate capacity and equipment should be available for subjecting springs to cent per cent scrag tests;
- (iii) the practice of giving load deflection test should be standardised for all the railways; and
- (iv) the present specifications in respect of the manufacture of springs should be made more comprehensive and precise.

504. We have been informed that the suggestions made have been implemented except that pyrometers and quenching medium bath at Samastipur Workshop on the North Eastern Railway are still to be obtained and cent per cent scrag testing of springs is done on only 5 out of the 9 zonal railways. On the Central, the Eastern, the South Eastern and the North Eastern Railways where the equipment is under manufacture, selective scrag testing is carried out. The specifications for the manufacture of springs have been made more comprehensive and adequate control is ensured by subjecting 5 per cent of carriage and wagon springs to load deflection tests.

505. The Kunzru Committee had also suggested that chalk tests should be given to hot axle journals in sick lines, and ultrasonic flaw detectors should be provided in carriage and wagon workshops and in major sick lines.

506. We have been informed that chalk tests are invariably carried out to detect flaws in axles and journal that may appear on the surface, and ultrasonic equipment for detection of hidden flaws in axles will be provided in carriage and wagon workshops and major sick lines on a phased programme.

507. *Time allowed for train examination and strength of train examining gangs*:—[Recommendations 141(ii), (v)—Pt. II]—The Kunzru Committee had observed that they received several complaints from the train examining staff that the time allotted for train examination was inadequate to permit a thorough and satisfactory examination of the wagons on a goods train. They also found that the time allotted for train examination and the strength of examining gangs varied from railway to railway. Such variations were not only wide but did not appear to be based on any rational grounds. The Kunzru Committee suggested that work studies should be undertaken

with a view to introducing a uniform schedule of time for examination of trains on all the Railways. They also recommended that a yardstick should be laid down to determine the strength of the train examining staff as a general guide to the Railways.

508. The Railway Board stated in their remarks that the Railways had laid down the minimum time for train examination after proper workstudy. They also advised us that they had laid down a minimum of $\frac{1}{2}$ minute per wagon for examination in case of incoming trains; this did not include the time for repairs. In case of outgoing trains, the minimum has been laid down as 45 minutes for examination of train and another 30 minutes for vacuum and brake adjustments. The Railway Board's instructions do not specify the nature of examination, i.e., whether intensive or ordinary for which these time-lengths are prescribed. The Railway Board further stated that the Railways had been advised to fix the gangstrengths on the basis of the time fixed by the Railway Board for train examination.

509. The Railways have furnished the information in regard to the time allowed for train examination on their systems at the starting and terminating stations and at the examining stations en route in their replies to the questionnaire addressed to them. This information is shown in Annexure LXXXI. It would appear that most of the Railways have fixed the time allotted for train examination on an ad hoc basis rather than on the basis of the yardstick laid down by the Railway Board. Some of the Railways have related the time prescribed for the examination of a train with the strength of examining gangs and the number of wagons while others have prescribed a fixed lumpsum time per train. Again some have made a distinction in the time allotted for intensive or ordinary examination of trains or the trains meant for interchange while others have not similarly qualified the time allowed for examination on their systems. We also notice wide variations in the strength of examining gangs on the different Railways. For instance, it is 25 men on the Eastern Railway, 20 men on the Northern Railway and 9 men on the Southern Railway for the intensive examination of a train.

510. The lack of standardisation in respect of both the time allowed for train examination and the strength of examining gangs is, thus, obvious. It may be that the conditions vary from yard to yard, as for example there may be occasional bunching of trains in certain yards necessitating examination of more than one train at a time, or the operational requirements may not permit a running line to be occupied for more than a specified time. But most yards are in our view subjected to these stresses and these cannot be the basis for fixing the time for train examination or the gangstrength in a manner that it varies considerably from yard to yard or from railway to railway. The nature and extent of examination of a wagon or a train has to be nearly the same at all places and at all times. The number of wagons on a train should therefore determine the time required for proper examination of a train and the number of men required to do the job within the allotted time.

511. We consider the adoption of a uniform basis for fixing the time schedule for train examination and for determining the strength of examining gangs by all the Railways not only advisable but essential for the proper examination of trains and urge that any further delay in implementing the Kunzru Committee's recommendations should be avoided.

512. *Neutral Control*—[Recommendations 142(v), 144 & 145—Part II]—The Kunzru Committee observed that the work of the neutral control staff was effective in ensuring a high standard in the maintenance of rolling stock and suggested that the Neutral Control Officer should submit a review containing broad conclusions drawn from the Reports of neutral control staff about the condition of the stock and the quality of work done in workshops and sicklines. They recommended that the system of neutral control examination should be extended on the broad gauge and introduced on the metre gauge. The Railway Board have advised us that subsequent to the recommendation of the Kunzru Committee, neutral control examination was extended to 8 points on the broad gauge and introduced at 7 points on the metre gauge. There were thus 43 such points on the Railways on 31-3-1968, comprising interchange junctions, marshalling yards, workshops and sicklines. The reports of the Neutral Control Officer are being received quarterly by the Board. The Chief Mechanical Engineers and Chief Operating Superintendents of the Railways also get copies of these reports.

513. In order to have a broad comparison of the quality of the work done in the different workshops, the Kunzru Committee had examined the rejections made by the neutral train examiners at the 'bharline' of the workshops. They found that the average percentage of rejections amounted to 12 per cent during 1962-63. We find that in 1967-68, the percentage of such rejections has dropped to 4.4, even though the number of wagons examined by the neutral control staff was 77,589 in 1967-68 against 57,787 in 1962-63. This testifies to an improvement in the quality of the maintenance work being done in the workshops. Notwithstanding the overall improvement we find that the percentage of rejections in case of workshops on the Central Railway increased from 9.6 in 1962-63 to 10.3 in 1967-68. The percentage of rejections on the North Eastern Railway too increased from 3.1 in 1962-63 to 10.1 in 1967-68. The percentage of rejections on the North Eastern Railway was the highest of all the Railways in case of marshalling yards as well as sicklines.

514. We also examined the results of the spot checks conducted by the Flying Squads of Neutral Control on the trains after examination by the Railways from April 1967 to March 1968. The results of these checks on the different Railways were as under:—

TABLE 66-A

Railway	Number of wagons examined	Number with rejectable defects	Percentage
Central	2264	1399	61.8
Eastern	2524	1721	68.2
Northern	1915	1025	53.5
North Eastern	1533	885	57.7
Northeast Frontier	1069	472	44.2
Southern	2522	1366	54.2
South Central	3621	1856	51.3
South Eastern	1829	1198	65.5
Western	2578	1528	59.3

515. This brings out the highly unsatisfactory position in respect of examination of the trains by the train examining staff on the Railways. We reiterate what the Kunzru Committee had already stressed that the deficiencies in train examination should be speedily removed in the interest of safe and efficient operation.

516. *Incidence of hot boxes*—[Recommendations 140 and 155(v)—Part II]—The Kunzru Committee had stated that the incidence of hot boxes in coaches was much higher on the metre gauge than on the broad gauge and that the reverse was the case in respect of incidence of hot boxes in wagons where it was much higher on the broad gauge. They also found wide variations in the incidence on the different Railways. They emphasised the need for a critical and comparative study of the causes of these variations to derive helpful conclusions.

517. The Railway Board had set up a research cell under Director, Research (Hot Boxes), for undertaking extensive studies, research and practical trials with a view to suggesting measures for minimising the incidence of hot boxes. The Director, Research (Hot Boxes) submitted the Investigation Report in September, 1966. The Railway Board have advised that detailed instructions were issued to the Railways regarding the follow-up action to be taken on the short term and long term measures recommended in the Report of the Director, Research (Hot Boxes) and the targets to be achieved. The targets fixed by the Board are as under:—

- (i) Coaching stock—BG and MG = 1.0 per 10 million vehicles kilometres.
- (ii) Goods Stock
 - 1. Broad gauge—
 - (a) Eastern and South Eastern Railway ... = 5.0 per million wagon kilometres.
 - (b) Central, Northern, North Eastern, Northeast Frontier, Southern, South Central and Western Railways ... = 2.5 per million wagon kilometres.
 - 2. Metre gauge ... = 0.5 per million wagon kilometres.

518. The incidence of hot boxes on coaching stock during the last five years on the Indian Railways is shown below in juxtaposition with the incidence as recorded by the Kunzru Committee for the years 1960-61 to 1962-63:

TABLE 67

Year	Incidence of hot boxes on coaching stock per 10 million vehicle kilometres	
	Broad gauge	Metre gauge
1960-61	1.91	5.74
1961-62	1.57	4.84
1962-63	1.63	3.97
1963-64	1.02	2.94
1964-65	1.12	2.82
1965-66	1.09	2.51
1966-67	1.11	3.92
1967-68	1.24	6.41

519. It will be observed that the incidence of hot boxes, having steadily declined on both the gauges till 1963-64, has since 1965-66, shown a rising trend on the broad gauge and the metre gauge. In fact, the incidence on the metre gauge during 1967-68 was the highest since 1960-61, i.e., during the last eight years. The pattern noticed by the Kunzru Committee of the incidence of hot boxes in coaches being two and a half times higher on the metre gauge than that on the broad gauge has not only been continuing more or less, but the disparity has, in fact, widened to more than five times in 1967-68. The incidence of hot boxes on the coaching stock on the different Railways is given in Annexure LXXXII.

520. The principal causes of hot boxes on coaching stock and the percentage of their relative contribution over the last five years on the broad gauge and the metre gauge are shown in Annexure LXXXIII. It will be observed that the largest number of hot boxes on the broad gauge were due to "extraction of packing" or "other causes." On the metre gauge, the main contributory causes were "dry packing" and "other causes".

521. It has been stated in the Investigation Report of the Director, Research (Hot Boxes) that one of the reasons for the higher incidence of hot boxes on coaching stock on the metre gauge as compared to the broad gauge is that the standard of preventive maintenance on the metre gauge has not reached the standard obtaining on most of the broad gauge depots. It is also pointed out in the said report that the performance of some Railways is far superior to that of other Railways on the same gauge and all that is necessary is the implementation of the short term measures recommended in the report and satisfactory execution of maintenance. The increasing incidence of hot boxes on coaching stock on both the gauges over the last three years is a pointer to the need for the effective implementation of the recommendations of the Director, Research (Hot Boxes) and a further critical study, if necessary.

522. The incidence of hot boxes on goods stock during the last five years on the Indian Railways is shown below in juxtaposition with the incidence recorded by the Kunzru Committee for the years 1960-61 to 1962-63:

TABLE 68

Year						Incidence of hot boxes on goods stock per million wagon kilometres	
						Broad gauge	Metre gauge
1960-61	..	..	..	..	..	5.30	2.36
1961-62	..	..	..	..	..	6.3	1.93
1962-63	..	..	..	..	..	7.43	2.85
1963-64	..	..	..	..	..	6.9	2.9
1964-65	..	..	..	..	..	7.3	1.3
1965-66	..	..	..	..	..	5.7	1.4
1966-67	..	..	..	..	..	3.9	1.5
1967-68	..	..	..	..	..	3.7	1.5

523. It will be seen that the incidence of hot boxes on goods stock has shown a declining trend on the broad gauge over the last four years. It, however, remained more or less, static on the metre gauge during this period but the figures are wide off the targets prescribed. The pattern noticed by the Kunzru Committee, namely, the incidence of hot boxes in wagons being higher on the broad gauge as compared to the metre gauge has continued. The disparity between the incidence on the two gauges has, however, been narrowed down during the last two years on account of the marked improvement achieved on the broad gauge. The incidence of hot boxes on the goods stock on the different Railways is given in Annexure LXXXIV.

524. The principal causes of hot boxes on goods stock and the percentage of their relative contribution on the average over the last five years on the broad gauge and the metre gauge are given in Annexure LXXXV. It will be observed that chief contributory factors on both the broad gauge and the metre gauge have been "dry packing" and "other causes."

525. The Kunzru Committee had observed that the R.D.S.O. was not fully associated with, and was not in control of, the investigation for finding out the packing suitable for reducing the incidence of hot boxes.

526. The Railway Board have stated that the R.D.S.O. did carry out detailed research into the problems connected with hot boxes and their report was published in September, 1965. The R.D.S.O. investigated the performance of various components of a plain bearing axle box assembly. The conclusions of the RDSO were taken into account by the Hot Box Cell. At the suggestion of the Hot Box Cell, the RDSO also undertook laboratory investigations of lubricating oil of different viscosities and the details were published in a report in July, 1967. The R.D.S.O. recommended that service trials with a large number of wagons should be undertaken with oil having viscosity in the range of 12 to 15 per cent at 99°C. These trials are being undertaken.

527. *Periodical overhauling of stock*:—[Recommendation 142(i)—Pt. II]—The Kunzru Committee examined the position in respect of periodical overhauling of coaching and goods stock and desired that proper action should be taken to bring down the extremely high percentage of stock overdue for periodical overhaul to a reasonable figure. They suggested that the overhauling capacities should be expanded considerably to cope with the increase in the fleet of rolling stock.

528. The Railway Board have advised us that this is the recognised policy and adequate capacity to cope with the increase in the rolling stock has been provided.

529. As regards the observation of the Kunzru Committee that the schedule of periodical overhaul had been extended on an empirical basis to meet the expanding requirements regarding the overhauling of wagons resulting from the large increase that had taken place in the goods stock without commensurate expansion in the overhauling capacity, the Railway Board have stated that the periodicity was not changed because of inadequate capacity in railway workshops but because it was found that wagons could be kept in service for a period of $3\frac{1}{2}$ years between two successive periodical overhauls without any adverse effects.

530. We have examined the position in respect of coaches overdue periodical overhaul. We find that on the broad gauge, out of the total holding of 18,296 coaches on 31-3-68, 2,709, i.e., nearly 15 per cent coaches were overdue periodical overhaul. On the metre gauge, out of the total holding of 16,249 coaches, 2,272 coaches, i.e., 14 per cent were overdue periodical overhaul. There was thus an overall reduction in the number of coaches overdue periodical overhaul on Indian Railways as compared to the position as obtaining on 31-3-1963 when 3,908 broad gauge and 3,463 metre gauge coaches were overdue periodical overhaul. The Central and the South Eastern Railways had 288 and 334 coaches respectively, i.e., nearly 13 per cent each of their respective holdings of 2,314 and 2,448, as overdue for periodical overhaul. On the metre gauge, the position was unsatisfactory on the North Eastern and the Northeast Frontier Railways which had nearly 24 per cent and 18 per cent respectively, of their holdings of 3,487 and 1,997 coaches overdue periodical overhaul.

531. The Kunzru Committee found that on 31-3-63, out of a total holding of 2,59,033 wagons on the broad gauge, 12 per cent of these, i.e., 31,417 were overdue periodical overhaul and on metre gauge out of the total holding of 1,02,471 wagons, 15 per cent, i.e., 14,847 wagons were overdue periodical overhaul. The position as it existed on 31-3-68 was that out of 2,88,765 wagons on the broad gauge 25,310 wagons, i.e., about 9 per cent of the total holding were overdue periodical overhaul. On the metre gauge 9,955 wagons out of the total holding of 1,03,794 wagons, i.e., nearly 10 per cent of the holding were overdue periodical overhaul. There is thus a marked reduction in the number of wagons overdue periodical overhaul on both broad and metre gauges.

532. The Northeast Frontier Railway, in reply to our questionnaire, has stated that due to inadequate capacity for periodical overhaul, based on the schedule specially applicable to that Railway, there is a shortfall of 1,000 units per annum. The Railway has added that with a view to overcoming shortage of periodical overhaul capacity, a proposal for further expansion of the New Bongaigaon shops for additional periodical overhaul capacity of 4.5 units per day was included in the preliminary Works Programme of 1968-69 but the Railway Board have not agreed to the inclusion of the proposal and had asked for further details for Board's scrutiny. In the meantime, the Railway Board have issued instructions that the North Eastern Railway should undertake periodical overhaul of 48 units of coaches of Northeast Frontier Railway per month.

533. We would urge that efforts to normalise the position and to reduce the number of coaches and wagons overdue periodical overhaul still further should continue.

534. *Overaged coaches and wagons:*—[Recommendation 143 Part II]—The Kunzru Committee examined the position on the different railways in respect of the overaged coaching stock on the broad gauge and the metre gauge as it existed on 31-3-63. They found that on the broad gauge such stock constituted 34 per cent (i.e. 5,351 of the total holding of 15,664) and on the metre gauge 26 per cent (i.e. 3,279 out of the total holding of 12,559). The Kunzru Committee observed that these percentages were high

and should be gradually reduced. They suggested that in the meantime, the use of overaged coaches should be limited, to the extent possible, to local trains and shuttle services.

535. As regards the overaged wagons they found that as on 31-3-63, out of the total holdings of 2,36,112 wagons on the broad gauge, 24,115 or about 10 per cent were overaged and on the metre gauge, out of the total holdings of 89,197 wagons, 11,555 or about 13 per cent were overaged. They suggested that these percentages should be progressively reduced.

536. The Kunzru Committee further recommended that the overaged stock, both coaching and goods, should receive special attention while passing through shops as well as in sick lines. They suggested that, for this purpose, such stock should be distinctly marked so that the staff dealing with repairs should bestow special attention. They also suggested for the Railway administration's consideration whether the period of overhauling of such overaged stock should not be suitably reduced and their utilisation should be, as far as possible, limited to specific areas.

537. The Railway Board in their remarks have observed that the recommendation about the utilisation of overaged coaching stock, as far as possible, on local trains and shuttle services, pending their gradual withdrawal from service has been accepted. They have indicated that, in fact, this principle was already being followed in practice. They added that all rolling stock in service was given proper attention both in the major workshops and in the maintenance depots irrespective of age of the stock and, in the process, the stock received the extra attention required. They do not consider it necessary to prescribe different intervals between successive periodical overhauls in respect of overaged and other stock as all stock coming for repairs is brought upto the standard and the parts which require replacement are changed.

538. The position in respect of overaged coaches and wagons as it existed on 31-3-1968 is shown in Annexure LXXXVI. It will be seen that there has been a marked reduction in overaged coaches both on broad gauge and on metre gauge. The Central and the Northern Railway had about 28 per cent coaches overaged on the broad gauge and the Northern and Southern Railways had 30 and 21 per cent coaches overaged on the metre gauge on that date. There has also been an overall reduction in the number of overaged wagons on the broad gauge but on the metre gauge there has been a noticeable increase. The Northern Railway had 23 per cent of its total holdings on metre gauge overaged on that date. We urge the Railways to continue their efforts to reduce the number of overaged stock, particularly metre gauge wagons.

539. *Train Partings*:—[Recommendations 137, 138 & 139 Pt. II]—The Kunzru Committee observed that in 1962-63, goods train partings had increased appreciably, while passenger train partings had come down on both the gauges. They considered that the methods adopted and the precautions taken by the Central Railway, where the incidence of train partings was the lowest, should serve as a guide for action on other Railways. They further suggested early replacement of Class II steel by Class IV steel and the standardisation of the procedure for electric welding, proper

heat treatment and control testing of non-standard drawbars in order to reduce train partings. They also said that the R.D.S.O. should lay down tolerances in respect of buffer projections and wear on individual drawbar components to reduce the probability of slack coupling.

540. The Railway Board have advised us that all Railways have analysed train partings on the same basis as was adopted by the Central Railway and they have also adopted the necessary precautions to reduce train partings. We have been further informed that all standard stock on the broad gauge has been fitted with drawbars manufactured out of Class IV steel. As far as non-standard stock is concerned, 2038 wagons, which are over 40 years old, are still operating with Class II steel drawbars on the South Eastern Railway. On the metre gauge, all standard stock has been fitted with drawbars made of Class IV steel; 90 per cent of the non-standard stock has also been fitted with drawbars made of Class IV steel. The balance of the non-standard stock is being progressively fitted with drawbars of Class IV steel as and when the drawbars break or when the stock passes through the shops. No drawbars are now being manufactured out of Class II steel. The standard procedures for welding, heat treatment and control testing have been adopted.

541. The Railway Board have also indicated in their comments that the R.D.S.O. was asked to examine the question as suggested by the Kunzru Committee. The Railway Board have approved the revised wear limits for screw coupling and draft gear components on the broad gauge. The minimum buffer projections have been revised from 22" to 23" as a result of the recommendations of the Carriage and Wagon Standard Committee.

542. The R.D.S.O. has worked out the design of a new screw coupling which reduces the slack, screw couplings of this modified design have been fitted to a few wagons for field trials. The need for any further increase in the minimum buffer projections beyond 23" will be examined after the results of trials are available.

543. We have examined the incidence of train partings on passenger trains on the Indian Railways during the last five years in juxtaposition with the period reviewed by the Kunzru Committee. The position is shown below:

TABLE 69

Incidence	Broad gauge		Metre gauge	
	1957-58 to 1962-63	1963-64 to 1967-68	1957-58 to 1962-63	1963-64 to 1967-68
Average number of train partings per year ..	66	60	31	25
Average incidence per 100 million vehicle kilo- metres	2.90	2.22	2.45	1.76

544. There has thus been an improvement in respect of passenger train partings on both the gauges. However, the incidence of passenger train partings on the Western Railway on the board gauge and on the Northeast Frontier Railway on the metre gauge was high and well above the overall average, the incidence being 4.06 per 100 million vehicle kilometres on each of the two Railways.

545. The position in respect of train partings on goods trains during the last five years in juxtaposition with the preceding six years ending with 1962-63 is shown in the following table:—

TABLE 70

Particulars	Broad Gauge		Metre Gauge	
	1957-58 to 1962-63	1963-64 to 1967-68	1957-58 to 1962-63	1963-64 to 1967-68
Average number of train partings per year ..	1135	514	457	526
Average incidence per hundred million wagon kilometres	19.6	6.8	23.2	22.5

546. It is observed that there has been a considerable improvement in the incidence of goods train partings on the broad gauge; the incidence has been reduced from 19.6 to 6.8 per hundred million wagon kilometres. This improvement is reflected in the performance on all the Railways. On the metre gauge also there has been a slight improvement in the incidence of goods train partings. The incidence has fallen from 23.2 to 22.5 per hundred million wagon kilometres. On the North Eastern and the Southern Railways, however, there was some deterioration in the incidence of goods train partings.

547. We have examined the causes of the train partings on both passenger and goods trains. We find that in case of passenger trains the main contributory factors on the broad gauge were flaw in metal, severe jerk, defective fittings and factors grouped under 'other causes' such as working out or breakage of drawbar shackle pin, drawbar projecting due to spring being weak, etc. On the metre gauge, the largest number of train partings on both the passenger and the goods trains were caused by flaw in metal, severe jerk and the factors grouped under 'other causes'.

548. We hope that the measures which brought about improvement in the position of train partings will be sustained and intensified.

Stores, Post-Accident Relief Measures and other matters

549. *Stores and spare parts for maintenance of Rolling Stock*—[Recommendations 146, 147(i) to (v)—Part II]—The Kunzru Committee had laid great emphasis on the shortcomings in the matter of supply of stores on the Railways and had criticised several aspects relating to the procurement of stores. The unsatisfactory position and quality of stores had led the Kunzru Committee to conclude that scheduled repairs, normal maintenance, periodical overhaul of locomotives, carriages and wagons were suffering to an extent that affected safety. They had recommended that in regard to the availability of stores and spare parts for the maintenance of rolling stock, one or more Central Workshops should be started at suitable places for the manufacture of those essential parts which are generally in short supply.

550. The Railway Board stated in their comments that adequate capacity exists for the manufacture of spare parts and the proposal for setting up of a Workshop for manufacture of loco components had been examined and given up due to surplus capacity being available in the existing Workshops. Much increased capacity for such items is now also available in private industry.

551. In reply to our questionnaire, the Railways advised us that the position is generally satisfactory except in the case of non-ferrous metal components, some imported items and those procured through the agency of the Directorate General of Supplies and Disposals. In the evidence led before us, it was pointed out that though the position in regard to availability of stores has improved, considerable time and energy of the executive officers is spent in chasing the items which still remain in short supply.

552. We examined the position in regard to the compliance of indents. We found that during the year 1967-68, the compliance generally ranged from 75 to 85 per cent in respect of both workshop manufactured and purchase items. In respect of the items procurable through the Directorate General of Supplies and Disposals, however, the information furnished by the Railway Board showed that in some cases delays to the extent of 20 to 25 months occurred after the expiry of the due dates. We deal with this aspect further in the subsequent paragraphs. Here we would say that though there has been some improvement in the availability of stores, there is considerable scope for further improving the position.

553. Procedure for procurement and enhanced powers of purchase—The Kunzru Committee laid great stress on the simplification of the procedure for bulk procurement of stores through the agency of the Directorate General of Supplies and Disposals which, according to them, was a time consuming process. They deplored the over-emphasis on accepting the lowest tenders and felt that the due weightage should be given to the reliability of the supplying firms. The Kunzru Committee also considered that the Divisional Superintendents and the Districts Mechanical Engineers should be given enhanced powers to purchase stores.

554. The Railway Board advised us that the Progress Wing of the Directorate General of Supplies and Disposals had been re-organised by the setting up of a separate Directorate to handle Railway indents and contracts. The problems associated with the procurement of railway stores through this agency have been lessened appreciably since the creation of this wing. In regard to the proposal for enhanced purchase powers, the Railway Board advised us that the Ministry of Works, Housing and Supply had not accepted the proposal for the enhancement of the purchase power of the Controller of Stores of the Railways from Rs. 25,000 to Rs. 50,000 in each case, in respect of items not covered by the rate/running contracts, on the grounds that it would create more competition in buying and greater difficulties for the Directorate General of Supplies and Disposals which, according to the Ministry of Works, Housing and Supply, is able to get the most competitive prices in the capacity of the central bulk purchaser. In respect of items covered by the rate/running contracts, enhancement of the purchase power of the Controller of Stores from Rs. 500 to Rs. 1,000 in each case and Rs. 5,000 to Rs. 10,000 in the aggregate in any one year have, however, been agreed to by the Ministry of Works, Housing and Supply.

555. As we have stated in a preceding paragraph, difficulties are still being experienced in respect of items procurable through the Directorate General of Supplies and Disposals and despite some improvement having been effected, the procedure still continues to be far from simplified. This assumes importance when we consider that about 30 per cent of the stores purchased by the Railways (not including coal) are acquired through the Directorate General of Supplies and Disposals. Out of Rs. 324 crores worth of stores ordered by the Railways during the year 1966-67, nearly Rs. 100 crores worth of stores were procured either through that agency or against rate contracts entered into by that agency. The over-dependence of the Ministry of Railways on the Directorate General of Supplies and Disposals for their requirements and the effect this has on the availability and procurement of stores is thus a matter of considerable concern. It is obvious that a purchase organisation which is not directly responsible to the user would not be expected to exercise the sense of urgency which the user would attach to his requirements. This is illustrated by the fact that on 1-7-1968, there were as many as 4629 contracts outstanding of which 400 had been placed prior to 1963 and 2300 between 1964 and 1966. We propose to advert to this subject in Part II of our Report.

556. In regard to the complaint of over-emphasis on acceptance of the lowest tenders, the Railway Board have pointed out that the extant rules do not preclude non-acceptance of the lowest tender if it is otherwise not acceptable nor is it obligatory for the competent authority to obtain the sanction of the next higher authority if the lowest tender is not accepted. While, thus, discretion is allowed to the authority to reject the lowest tender, in practice we find that such discretion is rarely used in favour of reliable firms as the purchasing authority is frightened of criticism sponsored by the rejected tenderers. We feel that a bolder attitude in such cases will be in public interest.

557. The Railway Board have also advised us that the purchase powers of the Divisional Superintendents and of the District Mechanical Engineers (on non-divisional systems) were enhanced upto Rs. 500 per item but not exceeding Rs. 5,000 in aggregate per month for a period of one year as an experimental measure. With effect from August, 1967, these powers were delegated as a permanent measure.

558. We have been advised by the Railway Board that the safety items of stores have been uniformly listed on all the Railways and that the supply position of these items is generally satisfactory and shortages, if any, are only of an occasional and local nature. Some of the Railways, on enquiry by us, had expressed ignorance of the existence of the standardised lists of safety items of stores as prescribed by the Railway Board. We hope, the Railway Board would clarify the position to the Railways.

559. We wish to add here that planning and procurement of the many thousands of items of railway stores, essential for the safe and efficient operation of the large Indian Railway system, present several complicated features for which the best solutions might well be sought through the adoption of more scientific methods. We consider that inventory control in an enormous undertaking of this nature is a vital factor. This should include varying yardsticks for different categories of items. With the large scale growth of goods and passenger traffic on Indian Railways, and the hundreds of new items wanted, it is apparent that modern methods will have to replace many of the old stores procedures.

560. *Accidents caused by tampering with track*—[Recommendations 16, 17, 18(i), 19, 20(i) to (iii), 21 & 22—Part I]—The Kunzru Committee had observed that the accidents caused by tampering with the track presented a formidable problem which was susceptible of no easy and complete solution. It is impossible to anticipate the attempt or the place where a saboteur will strike and to keep a constant watch over every yard of the track and to protect it completely and at all times from unlawful interference since it takes only a few minutes to remove the rails. While recognising that it is impossible to suggest any measures which would wholly and effectively prevent sabotage or detect it in time to avoid an accident, the Kunzru Committee considered that a substantial measure of security could be achieved by the implementation of the recommendations made by the Commission of Inquiry into Padali accident.

561. The Kunzru Committee, more or less, reiterated the recommendations of the Commission of Inquiry into Padali accident elaborating these, where necessary. Their suggestions were:—

- (i) On known vulnerable sections, which are not provided with CST 9 sleepers, the economics of relaying tracks with CST 9 sleepers should be studied. Such relaying should be done even at appreciable sacrifice in order to secure certain amount of protection against attempts at sabotage by use of reverse jaw sleepers at the rate of three per rail length.
- (ii) The welding of rail joints offers some resistance against attempts at sabotage. The economics and feasibility of welding rails should be considered on sections known to be vulnerable to attempts at sabotage and given preference over other sections. The experiment of welding half a mile length of rails should also be accelerated in the interest of protection against sabotage.
- (iii) A better type of headlight with automatic swivelling mechanism should be evolved although it could not be considered a wholly effective anti-sabotage device.
- (iv) The Railway Administrations should judge the vulnerability of a section and introduce, as required, immediate patrolling by gangmen and Railway Protection Force; checks should be exercised to ensure that the patrolling is performed properly and effectively. The Railways should then seek the cooperation of State Governments.
- (v) The coordination between the Railways and the State Governments in the matter of security patrolling on vulnerable sections had been lacking prior to the accidents caused by tampering with track. The problem of security patrolling should be discussed between the Ministries of Home Affairs and the Railways early.
- (vi) The cooperation of the residents of the adjoining villages for sharing responsibility for guarding the railway track should be secured.
- (vii) Substantial awards for information leading to apprehension of miscreants should be given.

- (viii) Arrangements should be made for Police Officers to specialise in the investigation of cases of tampering with track.

562. The Railway Board have advised that:—

- (i) The advantage of the use of reverse jaw sleepers with CST 9 sleepers at the rate of 3 reversed jaw sleepers per rail length as an anti-sabotage measure is taken at the time of renewals when due though it is economically not feasible to relay existing track with CST 9 sleepers with reverse jaw sleepers in locations where such renewal is not warranted on age and condition basis.
- (ii) The Railways have been asked to put in long welded rails on trunk routes and main lines.
- (iii) Efforts to increase the range of illumination of the locomotive headlights have not yet succeeded and the Research, Designs and Standards Organisation is seized of the problem.
- (iv) Co-ordination between the Railways and the State Governments has not been lacking but it has not been possible to prevent sabotage due to enormous length of track and inadequate manpower resources at the disposal of State Governments.
- (v) The matter of security patrolling has been considered by the High Power Committee on Policing and Security on Railways.
- (vi) The Ministry of Home Affairs had asked the State Governments to undertake a systematic drive to impress upon the inhabitants of the villages in the vicinity of the railway lines that they were responsible for the safety of the track in their areas.
- (vii) The General Managers and the State Governments had been asked to give rewards for information leading to the arrest of offenders.

563. We have attempted to assess the efficacy of the various anti-sabotage measures in the light of the rising trend in the incidence of such accidents over the last 15 years. We addressed a questionnaire to the Railways on the anti-sabotage measures being adopted on their systems. We have it in replies from the Railways and the Railway Board as well as in the evidence tendered before us that the use of reverse jaw sleepers in conjunction with CST 9 sleepers, welding of rails, and the illumination of track by the locomotive headlight are not fully effective as anti-sabotage measures. We further find that though there has been a substantial increase in the number of accidents due to sabotage over the past five years, the culprits, as before, have seldom been apprehended. There has been only one solitary case of reward having been given for information leading to the apprehension of a miscreant during the last five years. The Kunzru Committee had also found that despite a very large number of such cases since 1958, rewards had been offered only in three or four cases.

564. In regard to the suggestion for judging the vulnerability of sections of the railway line to sabotage and the security patrolling by gangmen and the Railway Protection Force over such sections, we note that the High-Powered Committee on Policing and Security of Railways have observed that to judge the vulnerability of a particular section of the railway to sabotage and to arrange patrolling should be the responsibility

of the State Government. According to the High-Powered Committee, the railway track, being a vital line of communication of the country, should not be treated as railway property in the narrow sense of the term and in case security arrangements by way of patrolling of the track have to be made for a protracted period and the State Governments are unable to do so without straining their resources too much, they may make a request, though not as a matter of right, for reimbursement from the central exchequer of the whole or part of the cost involved leaving it to the Government of India to judge each case on its merits. We understand that the recommendation is under the examination of the Government.

565. The Commission of Inquiry, appointed to ascertain the cause of derailment of 1 Down Bombay-Calcutta Mail train between Padali and Asvati on the Central Railway, on the night of 23rd November, 1957, conducted various tests from the driver's seat of a WP steam locomotive provided with the normal engine headlight and two swivelling headlights fitted on the front end buffer beam. The test conducted by the Commission showed that the illumination obtained with two headlights was somewhat more than that with a single headlight fitted in front of the smoke box on the centre line of the boiler. Experiments have been carried out by the Research, Designs and Standards Organisation using a 350 watt bulb in place of the normal 250 watt bulb in the parabolic projector. On account of its longer filament, the illumination with a 350 watt bulb is comparatively diffused. We consider that further experiments on better illumination with engine headlights are unnecessary. In bright sunshine or in the engine headlight at night, it is impossible for a driver to detect discontinuity of the track at the speed he normally works the train to avoid an accident.

566. It would appear that the measures suggested to prevent tampering with track have proved ineffective. We are not unaware of the complex and difficult nature of this problem. While recognising that no measures can altogether meet the menace of criminal acts, we would not like to strike a note of despair in the face of the mounting threat of anti-social elements. Steps for the security of the track against the dangers posed by the saboteurs will have to be persevered in and implemented with vigour. These steps as observed by the Kunzru Committee also lie in identifying the vulnerable sections wherever possible, patrolling of such sections by gangmen and Railway Protection Force, assistance from the authorities concerned with law and order, cooperation of the villages contiguous to the vulnerable tracks, apprehension of the culprits and deterrent punishments to those found guilty of attempts at train wrecking. These are the measures universally accepted as safeguards against sabotage. We know that these measures primarily fall within the purview of the Ministry of Home Affairs and the State Governments and there must necessarily be close and continuous coordination between these and the Railways if the designs of the saboteur are to be kept under restraint if not thwarted.

567. *Replacement of old wiring circuits by revised wiring circuits in coaches:—*[Recommendation 8(iv)—Part II]—The Kunzru Committee had found that electrical defects and short-circuiting of wires were responsible for more than one third of the fires in passenger trains. They suggested that the railways should take special steps to re-wire old coaches according to the revised design by a date to be fixed by the Railway Board.

568. The Railway Board advised us that they issued instructions to all railways to complete the rewiring of old coaches by 31-3-66 and that the railways have since completed the rewiring of all the old passenger coaches.

569. We examined the position in respect of the replacement of the old wiring circuits by new wiring circuits on the different Railways as it obtained on 31-3-1968. We find from the information furnished by the Railways that the work has been completed on all the Railways except on the Western Railway where the work in respect of 75 coaches still remains to be completed. This, we were informed, is expected to be completed shortly.

570. *Bogie medical vans*:—[Recommendation 193—Part II]—The Kunzru Committee recommended that all four-wheeler medical relief vans should be progressively replaced by bogie vehicles to permit them to be worked at higher speeds to the site of an accident.

571. The Railway Board in their comments had indicated that this was already the accepted policy and that the Railways had been asked to replace four wheeler medical relief vans by bogie medical relief vans.

572. The information furnished by the Railway Board shows that the number of bogie medical relief vans yet to be built is 17 for the broad gauge and 6 for the metre gauge. Out of these, some are meant to replace the four wheeler medical relief vans still in use. The number of the four wheeler medical relief vans and the time by which these are expected to be replaced has not, however, been indicated.

573. We hope that action will be taken to implement fully the Kunzru Committee's recommendation within the shortest possible time.

574. *Stabling of medical relief vans*:—[Recommendation 194—Part II]—The Kunzru Committee suggested the provision of sidings with double ends for stabling of medical relief vans within an year's time with a view to ensuring that the medical van would be turned out within a period of not more than ten minutes in the event of an accident. The Railway Board had issued instructions to the Railways to carry out the works accordingly. We have examined the position on the basis of the information furnished by the Railways. We find that the work has either not been completed or not yet been taken in hand at 26 stations on the different Railways, leaving aside those stations in respect of which the Railways have either indicated that the provision of a double-ended siding is not practicable or that it is unnecessary on account of the station being a terminus.

575. We hope that special efforts will be made to complete the work which has been outstanding for the last 3 years or so.

576. *Policy regarding the future of the Narrow Gauge lines*:—[Recommendations 9(ii) & (iii)—Part II]—The Kunzru Committee had recommended that the Railway Board should formulate, in consultation with the State Governments, proposals about the narrow gauge lines to be retained, abolished or converted to a wider gauge and to submit them to the Government for approval. They had urged that a clear decision should be taken on whether some of these narrow gauge sections not being economically viable units should be closed down or converted into wider gauge and that on the narrow gauge sections which the Government finally decides to retain, replacement of locomotives and rolling stock and renovation of track etc. should be undertaken more expeditiously than in the past.

577. The Railway Board have stated that a general policy decision regarding the conversion of narrow gauge lines to a wider gauge was not feasible, and that the question of conversion or retention or dismantling of each individual line would have to be considered on the merits of each case taking into account the traffic, availability of resources, etc. They added that they have to keep the expenditure on maintenance etc. on these lines to the barest minimum. A review of all the uneconomic branch lines was in progress so that it might be determined which particular line could be closed down without detriment to public interest. The future of the majority of the narrow gauge lines, thus, being uncertain no advance planning had been done with regard to programmed replacement of overaged rolling stock on the narrow gauge lines and a comparatively small percentage of overaged stock was currently being replaced. The general replacement policy followed in the case of the broad and metre gauges was not being followed in the case of the narrow gauge lines.

578. We are sorry to observe that despite the Kunzru Committee's exhortation and the urgency of the matter, no definite policy has been formulated by the Government in this behalf and this vital issue is still crying for a solution. On a reference from the Committee, the Railway Board stated that even an economic review of all the unremunerative narrow gauge lines has not yet been completed and in respect of the sections of which the economic review has been completed and has indicated a definite case for their closure, no final decision has been taken. Meanwhile, the matter in regard to renewal of track or replacement of rolling stock has been allowed to drift and is in the words of the Railway Board "more or less being done on an ad hoc basis.....". We have already referred to the percentage of overaged rolling stock on the narrow gauge sections in our analysis of the accidents during the last five years in Chapter II of our Report. We deprecate this policy of drift and indecision since it not only involves waste of public funds but also danger to the lives of the travelling public; and we urge once again that an unwavering policy be adopted in this behalf. Where adequate and prompt response from the State Governments is not forthcoming to the Railway Board's proposals, contacts should be made at the highest level.

579. In urging that this unfortunate picture should be changed, we are not unaware of the problems faced by Government in dealing with this matter. Apart from the normal resistance to drastic change there are local pressures brought to bear on Members of Parliament and through them on Government. There is also the difficulty of securing a response from the State Governments concerned. This brings us to the problem of political leadership which has to be faced some time and the earlier it is faced the better. In a not dissimilar situation, the British Government had requested Lord Beeching, a man of considerable stature and experience, to undertake an investigation into the lopping of the deadwood of uneconomic lines that had been accumulating over a period of years and which constituted an anachronism in the developing economy of that country. The Report, presented in 1963 by Lord Beeching, received widespread publicity and evoked a national discussion which resulted in a substantial part of his recommendations in regard to the closing down of uneconomic lines being speedily implemented. We recommend that similar action should be taken by our Government with a view not only to ascertaining the facts which may broadly be already known to the Railway Administrations but also in educating and mobilising public opinion on the subject.

CHAPTER V

RESEARCH DESIGNS AND STANDARDS ORGANISATION

580. The Kunzru Committee rightly attached special importance to the Research, Designs and Standards Organisation with its headquarters at Lucknow and showed foresight in visualising its increasing potential for various aspects of railway work. We are in entire agreement with this appreciation, expressed five years ago, and would like to pay tribute to the high quality that has since been built into most aspects of its activities. The trends noticed by us point to continuing improvements.

581. During our visits to the Research, Designs and Standards Organisation at Lucknow on September 10 and 11, 1968 we were most impressed with the spirit of dedication to their duties that seemed to animate the Director General and the entire staff of the Organisation. The work done in the Research, Designs and Standards Organisation in recent years and months has been notable and we would like to record our appreciation of the leadership, high morale and spirit of dedication that we found in this particular Organisation.

582. *Adequacy and scope*:—The Railway Board have generally accepted the Kunzru Committee's recommendations in these respects but have, in practice, made a distinction between the best utilisation of the latest scientific techniques, with their suitable adaptation for conditions in India, and the actual carrying out of appropriate research projects by the Research, Designs and Standards Organisation. Though there will always be differences linked with local conditions, there are nevertheless wide areas of advantageous standard practices followed throughout the world on all railways. There is thus much scope for avoiding duplications in research work through making intelligent use of results already proved and accepted elsewhere, as these can generally be made within reasonable periods and at comparatively little cost. In our view, the Railway Board and the Research, Designs and Standards Organisation are well geared to take advantage of this position through their international contacts.

583. *Periodical stock-taking of Research Programmes*:—[Recommendation 151—Part II]—The Kunzru Committee while expressing dissatisfaction with the limited achievements of research carried out over a period of ten to eleven years, had suggested a systematic periodic review of the results of research to see if it had kept pace with the needs of safety and efficiency in railway operation and with the developments in advanced countries.

584. The Railway Board agreed that the Research, Designs and Standards Organisation should work to carefully selected programmes and thus obtain optimum results from its efforts and necessarily limited resources. They also agreed that suitable individuals and equipment should be made available in good time to cater fully to each major item of the Research, Designs and Standards Organisation's programmes. It thus appears to have been agreed that, in such cases, the policy should be similar to that adopted when equipping a Task Force for a particular campaign where

clear objectives have been defined. Under such conditions, the strength and equipment of the Research, Designs and Standards Organisation will vary with the projects in hand and we feel that the Railway Board have met the Kunzru Committee's views in substance. We suggest, however, that formal planning and allocations of resources should be arranged well in advance in respect of important items to avoid time lags.

585. *Two separate Research Directorates*:—[Recommendation 150—Part II]—The Kunzru Committee has observed that the increased workload and in particular the wide scope of mechanical research justified the bifurcation of the research organisation into two separate research directorates.

586. The Railway Board have stated in their comments that additional posts of Joint Directors (Research) had been sanctioned for research in mechanical engineering, transportation and civil engineering. Besides, the metallurgical wing which had previously been in the Research Directorate had been separated and placed under a separate Director.

587. We feel that this recommendation of the Kunzru Committee is no longer a live issue as the range of expansion of the Research, Designs and Standards Organisation during the last 5 years has more than covered the field that the Kunzru Committee had in mind in 1963.

588. *Use of Universities for Railway Research Projects*:—[Recommendation 152—Part II]—The Kunzru Committee was of the view that greater use may be made of the various technical and research bodies and Universities etc. for solution of problems peculiar to Railways.

589. We consider that the equipment and capacity of non-railway research and technical bodies including Universities to undertake the solution of problems peculiar to Railways is very limited in India, unlike the position in some advanced countries. The Railway Board feel that a realistic policy should, therefore, be followed in this matter and for the present, the development of such facilities at the Universities be watched for some time before considering them for handling railway research problems.

590. *Assessment of results and frequency of meetings of Research Councils*:—[Recommendations 153 and 154—Part II]—The Kunzru Committee urged that the Central Board of Railway Research should meet twice a year and that the tenure of its members should be three years instead of two. They also felt that the Sub-Committees set up by the Central Board of Railway Research should hold meetings more frequently.

591. We find that regular meetings of the Central Board of Railway Research for periodic assessment of the results obtained by the Research, Designs and Standards Organisation are being convened. Also, international railway research contacts seem to be well established. A three-year tenure of membership of this body has been adopted instead of the former shorter tenure.

592. The Railway Board feel that well-attended yearly meetings of the Central Board of Railway Research are more useful and desirable than frequent gatherings which some members may not be able to attend. A major consideration, under Indian conditions, is the necessity for thorough field testing of research results during the heat of summer, humidity of monsoon and the cold winter months. We, therefore, agree that a 12-monthly frequency seems justified from these angles.

593. *Delays in solving problems:*—[Recommendations 55(i) to (viii)—Part II]—The Kunzru Committee had referred to the delays in finding solutions to the problems connected with the use of mechanical tampers, introduction of track recording car, improvements in Hallade track recorder, development of a suitable design for concrete sleepers, investigations for reducing incidence of hot boxes, development of automatic lifting barrier gates, developing the system of the automatic train control and modernising the methods of track maintenance.

594. We find that the Railway Board have heeded these views and the delays in finding solutions to these problems have in most cases been overcome. The Railway Board have reported that adequate progress has been made in developing varieties of mechanical and other measuring and recording appliances after trying out alternatives that have been found useful in other countries. Different designs of concrete sleepers have also been finalized for use under Indian conditions. Studies to improve day-to-day maintenance and servicing had also been commenced with close coordination between the Research, Designs and Standards Organisation and the executive and operating departments on Railways. We consider that research and development are continuing processes and results obtained at any point of time, however, beneficial they may appear, have to be looked upon as milestones on a longer road to greater achievements. Though we commend the results obtained during the past five years we would stress that there should be no slackening of efforts for still further improvements, particularly towards greater safety in all aspects of railway working. In regard to the problems connected with the automatic half barrier and the automatic train control, we have already made some observations in Chapter IV. Here, we wish to observe that in the case of such sophisticated and costly items, special measures including utilising the most expert advice obtainable are called for. We shall advert to these subjects again in Part II of our Report.

595. *Better Working of the Research, Designs and Standards Organisation:*—[Recommendations 156(i), (ii) and (v)—Part II]—The Kunzru Committee had observed that the basic requisite for the effective functioning of the Organisation was its adequate expansion and development both in equipment and personnel. The Kunzru Committee had also warned against undertaking research in items for which the Organisation was not fully equipped to complete the research successfully and also against applying laboratory research to railways without adequate field trials under its control.

596. The majority of the recommendations made by the Kunzru Committee for the better working of the Research, Designs and Standards Organisation have been accepted by the Railway Board. There are, however, certain items the successful and complete implementation of which, within a limited period, cannot be guaranteed. There are also a few others where the Railways continue to follow the established practices, for example, the field tests on open line under actual working conditions which are still operationally controlled by the Zonal Railways, although the Research, Designs and Standards Organisation's representatives are fully associated with them technically.

597. *Bridges and Floods*:—[Recommendation 157—Part II]—The Kunzru Committee considered that there is scope for increased activity in the Bridges and Floods Directorate for modernising the technique regarding the design and building of bridges.

598. We have satisfied ourselves that the Railway Board has given full weightage to the observations made by the Kunzru Committee in this regard. In the case of floods, water-ways under railway bridges, foundation problems etc., it is the general practice for the Railway authorities to consult the best experts in the country before finalizing their conclusions and designs.

599. *Separate Signalling Directorate*:—[Recommendations 157(i) to (iii)—Part II]—The Kunzru Committee recommended the creation of a full-fledged signalling directorate working in close coordination with a first class signalling workshop. They also suggested that technical collaboration might be entered into with appropriate foreign firms for the design and manufacture of electrical signalling equipment.

600. We find that there is already a separate Directorate in the Research, Designs and Standards Organisation under the charge of an Additional Director which handles all aspects of signalling and is currently engaged in introducing several modern developments. The need for Railways to collaborate technically with foreign firms in the manufacture of electrical or signalling equipment in India is no longer as great as before, as growing industrialisation, in both the public and private sectors, is already taking care of such matters.

601. *Proposals for strengthening the Research Organisation*:—[Recommendations 158, 159 & 171—Part II]—In the view of the Kunzru Committee, the proposals for strengthening the Research Organisation were inadequate when compared with the corresponding organisations on railways in some of the foreign countries.

602. The Railway Board have explained that the Research, Designs and Standards Organisation had already been expanded and better equipped during the past 5 years. We also find that further steps are in progress for its future growth. As stated previously, we favour its being looked upon as a standing Task Force.

603. We find that as against the sanctioned strength of 100 officers and 825 Class III technical staff at the time when the Kunzru Committee examined the working of the Research, Designs and Standards Organisation, the sanctioned strength at present is 246 officers and 1612 Class III technical staff. This would indicate some idea of the extent to which the Research, Designs and Standards Organisation has been strengthened during the last 5 years.

604. The Kunzru Committee had suggested an overall target of one per cent of the total expenditure on the Railways being spent on the Research, Designs and Standards Organisation. While we appreciate the approach of the Kunzru Committee in stressing the importance of research in this manner, it is obvious that the prescribing of a rigid percentage to be spent on the Research, Designs and Standards Organisation is not a feasible proposition except that it would help to ensure that this valuable Organisation will be adequately equipped to deal with the growing problems of the Railways.

605. We agree with the Board that testing under actual working conditions is a most important function of all applied research organisations for eventually, "the proof of the pudding is in the eating." For similar reasons, we agree that rigid sub-divisions of budgetary allotments between the various sections within the Research, Designs and Standards Organisation are also unnecessary.

606. *Recruitment and Training*:—[Recommendations 160 to 162—Part II]—The Kunzru Committee had stressed that Railway Officers with special aptitude for designing and research should be transferred to the Research, Designs and Standards Organisation and the age of retirement for experienced officers in this Organisation should be 5 years more than the normal age of superannuation.

607. We accept the view that suitability for discharging their duties efficiently plus some flair for this kind of work should be the criterion for selecting Railway Officers for the Research, Designs and Standards Organisation. Otherwise, this Organisation will obviously find it difficult to produce useful and timely results.

608. The Railway Board have assured us that all such matters affecting manning the Research, Designs and Standards Organisation will continue to receive their most careful attention. With changing conditions, however, they feel that some elasticity is desirable and the Railways cannot function, specially in staff matters, in complete isolation from other Government organisations in the country or ignore Service Commissions and Employment Exchanges. We urge that the Railway Ministry should do its best to staff the Research, Designs and Standards Organisation with the most suitable men available and ensure for them working and service conditions which will further contentment and keenness in their work.

609. As regards the tenure of such Officers while serving with the Research, Designs and Standards Organisation, we think that a period of four to five years should be the normal tenure. We would leave the age of superannuation to be considered in the wider context of public and 'service' considerations.

610. *Checks by the Research, Designs and Standards Organisation on quality of railway maintenance and manufacture in Railway Workshops*:—[Recommendation 167—Part II]—The Kunzru Committee had suggested the creation of an adequate and effective liaison organisation headed by a Deputy Director and assisted by Inspectors in the Research, Designs and Standards Organisation for the purpose of carrying out test checks on the quality of maintenance and the standards of manufacture of railway equipment on the Railways.

611. The Railways feel that this recommendation, if implemented, will tend to dilute the responsibility already placed on supervisory and other inspecting authorities and also result in some duplication. We agree with this view and consider that such practices would create new problems in addition to some friction. We also feel that it is unnecessary under present conditions. The responsibility for building in quality, as well as safety, in all aspects of operations should continue to be borne squarely by the executive administrations concerned. A safeguard is already provided by the inspection of manufactures in workshops not being under the Works Manager who is responsible for output but being controlled by an independent section that is answerable to another authority.

612. *Expansion of Documentation Section*:—[Recommendation 168—Part II]—The Kunzru Committee had suggested that the Documentation Section of the Research Organisation should be suitably expanded so that information on the work done in other countries on the same or similar subjects elsewhere is readily available and advantage can be taken of the fruits of research in other countries.

613. The Railway Board stated in their remarks that the desirability of the expansion of the Documentation Section is realised but the financial stringency of the Railways as reflected in the two consecutive deficit budgets makes it unavoidable for the expansion of this section to be deferred for the time being.

614. We agree with the Kunzru Committee that the Documentation Section needs to be adequately expanded and modernised so that the results of research being made in any part of the world can be not only acquired but translated in the languages in use in this country and widely publicised so that full use can be made of this information and benefit derived from it. We considered that it is a false economy, besides being shortsighted, to deny knowledge of the results of the valuable research connected with railway operation being carried out in different parts of the world to those working on and for the Railways and in particular to those engaged in research work. We hope that the Railway Board would adopt a suitable policy speedily.

615. *Collaboration between Research, Designs and Standards Organisation and makers of Railway equipment*:—[Recommendation 169—Part II]—We find that it was the general practice for many years for the Designs and Standards Offices on Railways to maintain close and continuous liaison with manufacturers of railway equipment both in India and abroad and we do not understand what occurred during 1962-63 to give the Kunzru Committee an impression to the contrary. If any factors have lessened such liaison during recent years, we agree that an early revival is very much in the interests of Railways themselves, particularly with the increasing manufacture in India of all varieties of Railway equipment.

616. *Time and Motion Studies*:—[Recommendation 170—Part II]—The Kunzru Committee had suggested that the Research Organisation should make work studies of maintenance practices regarding the permanent way and in sheds and workshops regarding the rolling stock as also of the effect of environment on the efficiency of staff.

617. While the Railway Board now appear more receptive to the Research, Designs and Standards Organisation developing team to carry out several aspects of performance and occupational research for purposes of increased efficiency and greater safety, 'time and motion' studies are usually best undertaken by consultants who specialise in such subjects. Also, such studies are usually linked to rate-fixing and these matters should, therefore, be left to the Railway executives in consultation with the best experts available to them. We recommend, however, that the results of performance research studies, under actual working conditions, be carefully examined by the Railway Board, at Directors' and higher levels, for improving the standard servicing and maintenance practices on zonal Railways.

618. *Import of modern research equipment:*—[Recommendation 172—Part II]—The Kunzru Committee had referred to the need for planning discriminately for occasional import of modern equipment from advanced countries with a view to keeping in touch with up-to-date ideas and techniques. The necessity to import even sophisticated modern equipment from advanced countries for research purposes has decreased considerably lately. A wide range of such equipment is already made by instrument manufacturers in India and in respect of certain specialised items for the Research, Designs and Standards Organisation, its own experts have shown considerable initiative by manufacturing these in their laboratories at Lucknow. We, however, agree with the Kunzru Committee that we should not hesitate to import whatever is not readily available in the country as otherwise we shall be depriving ourselves of the most progressive and up-to-date ideas embodied in such equipment.

619. *Use of Foreign Experts:*—[Recommendation 174—Part II]—The Kunzru Committee had recommended that an expert from one of the advanced countries may be associated with the Research Organisation and the services of one or more experts from abroad should be obtained for association with the Research Council for a periodic review of the progress made by the Research Organisation.

620. We find that the Railways have made good use of experts from the Japanese, German, British, French and other Railways in respect of some specific problems that were being handled by the Research, Designs and Standards Organisation. The Railway Board's policy is to continue this practice but on a more selective basis. They are always in touch with international railway research organisations who can assist them. We attach importance to this recommendation of the Kunzru Committee and we feel that there will be considerable advantage if experts in safety measures, which are answering well on railways in advanced countries, can be invited to visit Indian Railways in the near future to give their appreciation of the present position and of how train operation can be made safer, especially as the Railway Board are planning the early adoption of a programme for speeding up their Mail and Express services on trunk routes.

621. *Importance of the Head of the Research, Designs and Standards Organisation:*—[Recommendations 175 and 176—Part II]—We find that Railway Board have accepted the recommendation of Kunzru Committee regarding the status and power of the Director General of the Research, Designs and Standards Organisation. In this context, we would like to add that the tenure recommended for other responsible posts in the Research, Designs and Standards Organisation should also apply to its head, who should always be closely associated with the selection of individuals to fill important posts in the Research, Designs and Standards Organisation.

622. We conclude this chapter with our appreciation of the detailed examination by the Kunzru Committee of various aspects of the Research, Designs and Standards Organisation and are of the view that many of the improvements made during the past 5 years in this Organisation are largely due to this factor.

CHAPTER VI

SUMMARY OF OBSERVATIONS AND RECOMMENDATIONS

623. In the following paragraphs, we have summarised the observations and recommendations made by us in the foregoing chapters of this Report. Our endeavour has been to condense into this summary the more salient parts of our observations so that their purport is rendered in a concise form for the reader's convenience. We would, however, emphasise that a full and proper appreciation of what appears in the summary is possible only by going back to the observations in the main paragraphs which set out the background and the relevant facts and figures pertinent to the observation.

CHAPTER I—INTRODUCTORY

(1) We have decided to take a period of five years commencing from 1st April, 1963 and ending on 31st March, 1968 for the purpose of review of the position of accidents. (Para 3)

(2) We have decided to include in Part I of our Report (a) a statistical appreciation of the trend of accidents since the setting up of the Kunzru Committee and (b) an appreciation of the action taken by the Government on the Kunzru Committee's recommendations and our evaluation in regard to these. These cover item (i) of the terms of reference set down for us.

(3) We have decided that the second part of our Report would be devoted to suggestions to minimise accidents further as required in item (ii) of the terms of reference. We may find it necessary to amplify in Part II of our Report some of the observations made in the light of further information and elucidation. (Para 7)

CHAPTER II—STATISTICAL APPRECIATION OF IMPORTANT CATEGORIES OF TRAIN ACCIDENTS

(4) We have decided to confine our study mainly to the four principal categories of accidents, namely, collisions, derailments (including those caused by train wrecking), accidents at level crossings and fires in trains. In addition, other categories which are accidents only technically but are otherwise potential hazards, like averted collisions, breach of block rules and drivers passing signals at danger have been surveyed in broad terms.

(Para 8)

(5) The Kunzru Committee had surveyed the incidence of certain categories of accidents from 1957-58 to 1962-63. In order, therefore, to bring out a comparative perspective, we have, where possible, juxtaposed the corresponding figures for the years 1957-58 to 1962-63 in our study.

(Para 9)

(6) There was a significant decrease in the number of accidents in each of the four categories, namely, collisions, derailments, accidents at level crossings and fires in trains during the five years ending 1967-68 as compared to the 6-year period ending 1962-63. The decline over these years was fairly steady except for a slight reversal of the trend during 1967-68.

(Para 11)

Collisions

(7) The number of collisions on both the broad and the metre gauges came down considerably on all the Railways individually during the years 1963-64 to 1967-68 as compared to the preceding six years. (Para 20)

(8) We find that the wide gap in the incidence of collisions per million train kilometres between the broad gauge and the metre gauge, pin-pointed by the Kunzru Committee, has been considerably narrowed down during the last five years primarily because of the improvement on the broad gauge, even though the incidence on the metre gauge continued to be lower than on the broad gauge. (Para 21)

(9) We see no reason for fixing different targets for the broad gauge and metre gauge in respect of collisions and we are unable to subscribe to the view that the higher incidence of collisions on the broad gauge is inevitable. (Para 21)

(10) The incidence of goods train collisions per million goods train kilometres has been showing a more or less downward trend; the position in regard to passenger train collisions has been fluctuating. The incidence of passenger train collisions per million passenger train kilometres on both the broad and the metre gauges showed an increase in 1967-68. (Para 24)

(11) The largest proportion of collisions on the broad gauge during the period 1963-64 to 1967-68 was between 'two trains or between a train and light engine'. Such collisions constituted 50.6 per cent of the total number of collisions on the broad gauge. The incidence of such collisions shot up in 1962-63 and though since then, some decline has been registered, the incidence has continued to be high. (Para 26)

(12) The percentage of collisions 'between a train and a rake or load or vehicles stabled on a running line' during the period 1963-64 to 1967-68 was substantial. This is a pointer to the fact that lever collars and similar reminder appliances do not seem to be in regular use and this habit needs to be ingrained into the station staff. (Para 27)

(13) The incidence of collisions between 'a train and a trolley or a lorry' on the broad gauge registered a substantial decrease in the last five years when compared with the preceding six years. Considering that in most of such collisions responsibility rests squarely on the official incharge of the trolley or lorry who is usually a responsible railway official, there is considerable scope to reduce and, if possible, eliminate such accidents. (Para 28)

(14) The incidence of collisions between 'a train and buffer ends or other stationary objects' on the broad gauge has been fluctuating over the last 11 years and in particular during the first four years of the five-year period reviewed by us, the incidence has registered a rise from one to six. (Para 29)

(15) There has been a decline in the number of collisions on the metre gauge under each group except those between 'a train and buffer ends or other stationary objects' when comparing the five years 1963-64 to 1967-68 with the previous six years ending 1962-63. (Para 30)

(16) Our observations about the use of lever collars and reminder appliances, made earlier in the case of broad gauge, apply equally to metre gauge also. (Para 30)

(17) The average number of collisions caused by the reception of trains on blocked lines or despatching them into blocked sections in the years 1963-64 to 1967-68, taking the broad and the metre gauges together, remained more or less the same as during the preceding six years. (Para 34)

(18) The average number of collisions caused by drivers disregarding signals or failing to control trains during the five years ending 1967-68 remained more or less the same as during the preceding six years. (Para 34)

(19) The incidence of collisions due to failures of the station staff was the heaviest on the Central, the Northern and the South Eastern Railways; due to failures of drivers on the South Eastern and the Eastern Railways, and due to non-protection of trollies or lorries on the Southern Railway. (Para 36)

(20) Of the total number of collisions attributable to failures of station staff, nearly 71 per cent of these occurred at the time of reception of trains and 21 per cent at the time of despatch of trains. Of the collisions caused at the time of reception of trains, nearly half were due to lines being occupied and of the collisions which occurred at the time of despatch of trains, more than half of the collisions occurred due to obstruction of line. (Para 38)

(21) Of the total number of collisions caused by the failures of drivers more than half occurred due to the drivers disregarding or overshooting the signals governing them. (Para 40)

(22) The factor of speed has no marked correlation with the incidence of collisions within the authorised speed ranges. (Para 41)

Derailements

(23) The incidence of derailments shows a generally declining trend over the years on both the broad and the metre gauges, though on the broad gauge the position has been more or less static since 1965-66. (Para 48)

(24) The incidence of derailments on the metre gauge has continued to be consistently higher than on the broad gauge despite the lesser train kilometrage on the former. This has been there all through and was so even during the years 1957-58 to 1962-63. (Para 49)

(25) While overall, there has been an improvement in the incidence of derailments, the position, relating to midsection derailments has not kept pace with the improvement as registered in station derailments. (Para 50)

(26) The deterioration in position in regard to the midsection derailments on the broad gauge during the five years ending 1967-68 was contributed by the Northern, the Southern and the South Eastern Railways. (Para 50)

(27) There was a sharp rise in the midsection derailments on the metre gauge on the Northeast Frontier Railway. (Para 50)

(28) There was an increase in the number of passenger train derailments on both the gauges and of goods train derailments on the broad gauge during 1967-68 as compared to the previous year. (Para 51)

(29) The Southern Railway on the broad gauge and the Northeast Frontier Railway on the metre gauge are at the top in respect of passenger as well as goods train derailments per million passenger and goods train kilometres respectively. (Para 52)

(30) On the broad gauge, the incidence of passenger train station and midsection derailments was the highest on the Northern Railway and of goods train station and midsection derailments on the Central and the South Eastern Railways. (Para 53)

(31) On the metre gauge, the derailments involving both passenger and goods trains at stations were the heaviest on the North Eastern Railway and in midsection on the Northeast Frontier Railway. (Para 53)

(32) The incidence of derailments attributable to each of the broad causes, viz. staff failures, permanent way failures, carriage and wagon defects, engine defects and miscellaneous causes declined substantially on both the broad and the metre gauges in the five years ending 1967-68 as compared to the preceding six years, except in the case of engine defects on the metre gauge; the number of derailments on the metre gauge due to engine defects increased from 164 in the six years ending 1962-63 to 228 in the subsequent five years. (Para 55)

(33) The midsection derailments attributable to staff failures rose on the broad gauge from 66 during the six years ending 1962-63 to 95 during the five years ending 1967-68. On the metre gauge, the total number of midsection derailments attributable to this cause came down from 269 to 202. (Para 56)

(34) The total number of derailments attributable to permanent way failures came down substantially during the period under review as compared to the preceding six years; the number of midsection derailments attributable to this cause, however, increased significantly. (Para 57)

(35) The number of derailments attributable to carriage and wagon defects—both station and midsection—showed a decrease on both the broad and the metre gauges during the five years ending 1967-68 as compared with the preceding six years. (Para 58)

(36) The incidence of derailments attributable to engine defects showed a clear decline in the five years ending 1967-68 as compared with the previous six years on the broad gauge. On the metre gauge the incidence due to this factor went up in respect of both midsection and station derailments. (Para 61)

(37) There was a substantial reduction in the incidence of station and midsection derailments attributable to 'miscellaneous causes' during 1963-64 to 1967-68 as compared with 1957-58 to 1962-63 on both the broad and the metre gauges on all the Railways except the Northeast Frontier Railway. (Para 65)

(38) We have studied further the broad causes of derailments by classifying them according to their nature in order to have a closer look at each of the causes.

(Para 67)

(39) A large proportion of derailments attributable to staff failures on both the gauges was caused by incorrect setting or non-locking or faulty operation of points. Disregard of the approach and departure signals and failure to regulate or control trains on the broad gauge, excessive speed and faulty driving on the metre gauge were the other main contributory factors.

(Para 67)

(40) The largest number of derailments due to incorrect setting or non-locking of points and due to drivers' failures occurred on the Central Railway on the broad gauge and on the North Eastern Railway on the metre gauge.

(Para 68)

(41) A substantial number of derailments attributable to permanent way failures on both the gauges was caused by sinkage of track and other causes which are manifestations of unsatisfactory maintenance of track.

(Para 69)

(42) The incidence of derailments due to poor maintenance of track has been the heaviest on the Southern and the South Eastern Railways and due to sinkage of track on the South Eastern and the Northeast Frontier Railways.

(Para 70)

(43) The chief carriage and wagon defects responsible for derailments on both the gauges were defective or broken springs or suspensions, broken axles or journals, defective wheels or tyres and breakage of undergear, vacuum or brake fittings.

(Para 72)

(44) The incidence of derailments due to defective or broken springs or suspensions was the highest on the South Eastern and the Southern Railways due to broken axles and journals on the Northern and Western Railways and due to breakage of undergear and brake fittings on the South Eastern and the North Eastern Railways.

(Para 73)

(45) The largest single primary factor in derailments due to engine defects on the broad gauge was defective wheels and tyres. On the metre gauge too, this was the largest single factor next to 'other engine defects'.

(Para 74)

(46) The incidence of derailments due to defective wheels and tyres was the highest on the Southern Railway on the broad gauge and the Western Railway on the metre gauge.

(Para 75)

(47) We find that in a large number of cases of derailments, the cause is shown as 'accidental'. We apprehend that by treating the causes of derailments whole-sale as 'accidental', the administration's attention is unlikely to be pin-pointed on the source of trouble. It would appear to indicate as if the enquiring officers were bringing a departmental approach to bear on the question and avoiding the fixing of pointed responsibility.

(Para 77)

(48) We find that the speed factor does not have a direct correlation with the incidence of derailments.

(Para 81)

Accidents at level crossings

(49) Nearly 69 per cent of the accidents at level crossings during the last five years occurred at unmanned level crossings which constitute 62 per cent of the total number of level crossings. The remaining 31 per cent of the accidents took place at manned level crossings which constitute 38 per cent of the total number of level crossings. This broadly confirms the conclusion, earlier drawn by the Kunzru Committee also, that the manning of level crossings does not provide a completely satisfactory remedy against the accidents at level crossings.

(Para 89)

(50) The incidence of accidents per manned and unmanned level crossing taken separately as well as together has been reduced appreciably during the last five years as compared with the six years ending 1962-63.

(Para 90)

(51) The number of passenger trains involved in accidents at level crossings was more than of goods trains on both the broad gauge and the metre gauge systems; the disparity was greater in the case of metre gauge.

(Para 91)

(52) The number of accidents at manned level crossings involving passenger trains increased from 9 to 14 on the broad gauge and from 1 to 5 on the metre gauge during 1967-68 as compared to the previous year. This is a disturbing feature.

(Para 91)

(53) In the accidents at manned level crossings during the last five years, about 53 per cent railway staff and 47 per cent road users were involved in acts of omission and commission.

(Para 96)

(54) The largest proportion of the accidents at both manned and unmanned level crossings involved motor trucks, the bullock carts coming next. Between themselves, these two were involved in about two-thirds of all the accidents at level crossings during the last five years.

(Para 100)

(55) The number of accidents at manned level crossings was the highest during 00.00 to 04.00 hours, closely followed by that during 20.00 to 24.00 hours; during these 8 hours of night, 42 per cent of the total number of accidents at manned level crossings occurred. The need for intensive and surprise checks of gates at night is, thus, clearly indicated.

(Para 103)

(56) The largest number of accidents at unmanned level crossings i.e. about 38 per cent of the total number of accidents at unmanned level crossings occurred during the day, viz. from 08.00 to 16.00 hours and another 37 per cent during the hours of partial daylight, viz., 04.00 to 08.00 hours and 16.00 to 20.00 hours.

(Para 104)

Fires in Trains

(48) We find that the speed factor does not have a direct correlation with the incidence of derailments.

(Para 81)

Accidents at level crossings

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(Para 104)

Accidents on narrow gauge lines

(67) The number of accidents on the narrow gauge came down substantially during the last five years as compared to the six year period ending 1962-63. The decline is reflected in the incidence of all categories of accidents except collisions; the incidence of collisions during the two periods was more or less equal.

(Para 123)

(68) There were nine collisions, all involving passenger trains, on the narrow gauge during the last five years; six of these were between two trains including between a train and a light engine. Six of the collisions were caused by reception of trains on blocked lines or incorrect setting of points.

(Para 124)

(69) Derailments constituted nearly 83 per cent of all the important accidents on the narrow gauge during the last five years.

(Para 125)

(70) The number of station and midsection derailments on the narrow gauge was 68 and 247 respectively during the last five years.

(Para 127)

(71) Out of the 315 derailments, 74 occurred due to staff failures, 31 due to track defects, 70 due to carriage and wagon defects, 31 due to engine defects and 109 due to miscellaneous causes.

(Paras 128 to 132)

(72) The Kunzru Committee had attributed the high incidence of derailments due to carriage and wagon defects and engine defects partly to the high percentage of over-aged locomotives and rolling stock on the narrow gauge. We find that:—

- (i) the percentage of overaged locomotives on the narrow gauge has increased on all the Railways except the Northern Railway. On the Northeast Frontier Railway, all the locomotives on 31-3-1968 were overaged;
- (ii) the percentage of overaged coaches has been reduced on all the Railways except the Eastern Railway, all the 88 carriages on the Eastern Railway were overaged on 31-3-1968; and
- (iii) there was a marginal reduction in the percentage of overaged stock on the Northern, the Southern, and the South Eastern Railways; all the other Railways recorded an increased percentage; in particular, the number of overaged stock on the Eastern and the Southern Railways was high.

(Para 133)

(73) All the accidents at level crossings on the narrow gauge occurred at unmanned level crossings; the number of passenger trains involved in such accidents was about twice that involving goods trains.

(Para 135)

Breach of block rules

(74) A steadily falling trend is noticed in the number of cases of breach of block rules as also the incidence per million train kilometres on both the broad and the metre gauges.

(Para 141)

(75) The highest incidence of breach of block rules on the broad gauge and the metre gauge respectively was on the Central and the Southern Railways.

(Para 144)

(76) More than half, i.e. 53 per cent of the cases of breach of block rules were comprised of drivers' entering the block section without an authority or with an incorrect authority to proceed. In another 39 per cent cases the irregularities were on the part of the station staff who received trains on blocked lines or despatched them into occupied sections or closed the line when the section was not clear etc.

(Para 146)

(77) We find that the block irregularities take place preponderingly on the single line.

(Para 147)

Disregard of signals by drivers

(78) We find that out of 895 cases of disregard of signals, 266 resulted in mishaps, i.e. collisions, derailments or accidents at level crossings and 48 of the 266 cases related to passenger trains.

(Para 153)

(79) There has been a substantial reduction in the average number of cases of disregard of signals overall as also on the broad gauge. On the metre gauge, however, there was a marginal deterioration.

(Para 155)

(80) The incidence of disregard of signals in respect of both passenger and goods trains was the heaviest on the Western Railway on the broad gauge and the North Eastern Railway on the metre gauge.

(Para 157)

(81) On the broad gauge, the average number of cases in respect of each type of signals came down during the last five years when compared with the preceding six years except where two or more signals were disregarded together.

(Para 159)

(82) On the metre gauge there was an increase in the incidence of disregard of approach signals and a marked deterioration in respect of departure signals. This deserves due notice of the Railways concerned.

(Para 159)

(83) Signals on automatic territory were disregarded to the extent of nearly 7 per cent of the total number,

(Para 159)

(84) There was some deterioration in the incidence of disregard of signals on the South Eastern, the Western, the Southern and the Northern Railways during the years 1963-64 to 1967-68 as compared with the preceding six years.

(Para 160)

(85) During the last five years, three or more signals were disregarded together on no less than 19 occasions and all the four signals of a station were ignored at the same time in 6 cases. The disregard of two signals or more at the same time by the drivers indicates not merely a momentary lapse but a total aberration of the faculties of perception and control. We suggest that this would be a fruitful field for study by the Psycho-Technical Cell.

(Para 161)

(86) Nearly 81 per cent of the cases of disregard of signals on the broad gauge and 78 per cent of such cases on the metre gauge took place at stations provided with lower quadrant two aspect signalling.

(Para 162)

(87) On a number of occasions, signals were disregarded at stations equipped with multiple aspect upper quadrant and colour light signals on both the gauges. The need for educating the drivers in correctly observing the aspects of multiple aspect signals and correctly reading their indications is, thus, highlighted.

(Para 162)

(88) In relation to the total service of errant drivers, we find that the largest number of instances involved drivers with less than 5 years service followed by drivers whose length of service ranged from 5 to 10 years. Drivers with more than 15 years of service were involved in disregard of signals oftener than those with service ranging from 10 to 15 years. This phenomenon presents another useful field for study for the Psycho-Technical Cell.

(Para 163)

(89) We consider that a driver who disregards a signal is an incipient accident maker and should be classified as accident-prone. Public safety demands that he should not, as far as possible, be placed on driving duty thereafter.

(Para 164)

(90) We find that of the 682 drivers held responsible for the disregard of signals, over 60 per cent were in the age group of 45 years or less. More than half of the drivers, 367 in all, were using spectacles. These figures also furnish useful data for a clinical study of drivers by the Psycho-Technical Cell.

(Para 165)

Averted collisions

(91) There was a marked reduction in the number of averted collisions on both the gauges during the last five years as compared with the six years ending 1962-63.

(Para 167)

(92) The largest number of averted collisions occurred between 'two trains including between a train and a light engine' on both the gauges. Next came averted collisions between 'a train and a rake or vehicles or load stabled on a running line'. This highlights the need for enforcing the use of lever and slide collars until track circuiting becomes available. (Para 171)

(93) The incidence of each type of averted collisions was higher on the broad gauge as compared to the metre gauge. (Para 171)

(94) We find that of the staff found responsible for averted collisions, nearly 78 per cent were traffic staff and 14 per cent loco running staff. (Para 175)

CHAPTER III—SERIOUS ACCIDENTS DURING THE YEARS 1963-64 TO 1967-68—CAUSES AND CONSEQUENCES

(95) During the years 1963-64 to 1967-68, 79 serious accidents occurred on the Railways. In 78 of these accidents, statutory inquiries were held by the Commission of Railway Safety and in one case by a Commission appointed under the Commissions of Inquiry Act, 1952. (Para 178)

(96) The serious accidents during the last five years constituted 1 per cent of the total number of important accidents; these contributed 89 per cent of the deaths, 61 per cent of the injuries and 19 per cent of the damage caused by all the important accidents involving passenger and goods trains. (Para 180)

(97) The number of serious accidents increased from 74 in the five years—1957 to 1962—to 79 in the five years—1963-64 to 1967-68. (Para 182)

(98) The accidents attributable to failures of drivers and station staff, sabotage and accidents at level crossings were equal in number, namely, 56 during the two five-year periods. (Para 182)

(99) A study of the 56 accidents during the years 1963-64 to 1967-68 reveals that:—

- (a) the drivers caused 38 per cent of these, either by disregarding signals or by running at excessive speeds or by violating other safety rules;
- (b) station staff were responsible for 23 per cent of these by incorrect setting of points or by receiving or despatching trains on blocked lines or sections;
- (c) 30 per cent of these resulted from wilful tampering with track or other acts of sabotage, and
- (d) 9 per cent were level crossing accidents for all of which road users were found to be responsible.

(Para 183)

(100) The number of serious accidents due to failures of drivers and station staff or defects in track, rolling stock, engines and fires in trains registered a reduction during the last five years as compared to the preceding 5 years.

(Para 185)

(101) The increase in the number of serious accidents was almost entirely due to rise in the number of cases attributable to acts of sabotage, failures of road users and other miscellaneous causes, like rash acts of outsiders, natural calamities, explosions and undetermined causes.

(Para 186)

(102) The increase in the number of accidents caused by tampering with track or other acts of sabotage is a continuance of rising trend over the last 15 years which rose from 6 cases in the years 1952—1957, to 12 cases in next five years, and to 17 during the years 1963-64 to 1967-68. This evidence of lawlessness in our national life cannot but be viewed with disquiet.

(Para 187)

(103) The large increase in the number of casualties in serious accidents during the last five years as compared to the preceding 5 years was mainly on account of the two accidents on the Northeast Frontier Railway due to sabotage and a case in which the whole train was washed away by a tidal wave on the Southern Railway.

(Paras 188 and 189)

CHAPTER IV—AN APPRECIATION OF THE RECOMMENDATIONS MADE BY THE KUNZRU COMMITTEE AND OF ACTION THEREON.

(104) A precise assessment as to what extent the declining tendency in the incidence of accidents was a direct result of the implementation of the recommendations of the Kunzru Committee is difficult to make. Nonetheless, it is clear that the recommendations of the Kunzru Committee did make an impact in promoting safety in train operation on the Railways during the last five years.

(Para 192)

(105) (i) Our review of the more important of the recommendations made by the Kunzru Committee is based primarily on the information furnished to us by the Railway Board; but wherever we had in our possession data relevant to the implementation of any of the recommendations gathered either from the Railway administrations or from other sources, such data have been used to amplify our comments.

(ii) The other observations of the Kunzru Committee which are factual in nature or are suggestions which emphasise the observance of existing procedures and practices have been placed in an Appendix alongwith action taken as reported by the Railway Board and without our comments thereon.

(Para 193)

Staff

(106) (i) We find that the available capacities for training have been utilised partially and the percentage of utilisation of capacity in case of certain categories of staff has dropped on some of the Railways.

(ii) We urge that the factors which militate against the proper utilisation of training facilities should be located and remedied.

(Para 202)

(107) We find that while on some of the Railways no educational qualifications have been laid down for switchmen, on other different standards of education have been prescribed.

(Para 204)

(108) We are unable to appreciate the wide variations in the duration of initial and refresher courses on the different Railways for certain categories of staff. We suggest that a uniform practice in this regard should be adopted on all the Railways taking into account the requirements of the average employee in each category.

(Paras 205 & 206)

(109) We consider that certain minimum educational qualifications and the duration and nature of training to meet the job requirements should be prescribed for the maintainers who have actually to maintain the sophisticated signalling gadgets. We find that, at present, there is no uniformity on the different Railways. The frequency of refresher training for them also needs to be specified.

(Para 207)

(110) It is necessary that the training of staff should be examined in all its aspects, streamlined and rationalised.

(Para 208)

(111) We find that many Instructors in the Training Schools are those who had been selected on ad hoc basis. We were informed that many of them are "rejects" from the open line. Some of the Instructors in the Schools are there for more than a decade. We consider these aspects unhealthy and suggest that only persons with outstanding record of work to their credit on the open line should find their way into the Schools as Instructors. In our view, the tenure of Instructors should be three to five years so that training in the schools is not divorced from practical working on the line.

(Para 210)

(112) We find that in some cases the heads of the Zonal Training Schools remained at their posts for less than three years. We presume that whenever such transfers are ordered, the interests of training of staff are kept in view.

(Para 211)

(113) There is no uniformity in the practice of giving refresher courses to certain categories of staff on the different Railways. We consider that the categories of staff in need of refresher training should be given such training on all the Railways without any exception.

(Paras 219 & 221)

(114) We feel that much remains to be done if the backlog in refresher training is to be cleared and the recommendation of the Kunzru Committee effectively implemented.

(Para 221)

(115) Overall, the extent of shortages in the various categories of staff on 31-3-68 ranged between 1.4 per cent and 3.0 per cent except in the category of assistant drivers where the shortage was to the extent of 5.9 per cent. Over individual Railways, in some categories, the shortages have been glaring, but by and large the extent of shortage has been diminishing. We urge that this matter should continue to receive the urgent attention of the Railway administrations.

(Para 248)

(116) We feel that the measures necessary to curb overtime working by staff have not received the attention they deserved, in spite of the great stress laid on the subject of working conditions of staff by the Kunzru Committee.

(Para 262)

(117) We are unable to appreciate fully the object of clamping down the leave reserves at the level obtaining on 4-2-1967 notwithstanding its inadequacy as the directive of the Railway Board of that date sought to do. We strongly recommend that the question of overtime working and leave reserves should be examined early. We see no conceivable reason why the minimum limits of leave reserves fixed by the Railway Board should not be immediately implemented.

(Para 262)

(118) We find that on some of the Railways, the trips of running duty hours of more than 12 hours ranged between 15 per cent and 20 per cent of the total number of trips performed by the goods train drivers during 1967-68. Every Railway had instances of trips exceeding even 20 hours of running duty.

(Para 267)

(119) We urge that steps should be taken to ensure that the limit laid down in respect of duty hours of running staff is observed. Whenever, on any section, chronic long hours seem inherent, steps should be taken to change the crew at a suitable place so as not to infringe the prescribed duty-hour limitations.

(Para 269)

(120) We have examined the average time taken by the various Railway Service Commissions for recruitment of certain categories of staff. We find that the time schedule prescribed for the various categories by the Railway Board has often been exceeded by all Railway Service Commissions.

(Paras 274 & 275)

(121) We are informed that many of the panels of selected candidates are either partially used or not used at all by the Railway administrations on the plea of the vacancies anticipated at the time of the placing of incidents not materialising. We consider it necessary that the Railway administrations should assess their requirements on a rational basis, the Service Commissions should observe the time schedule and offers of appointments to the selected candidates should be made within a reasonable time.

(Para 276)

(122) We are informed that the procedure for recruitment of Class IV staff is cumbersome and results in delays. We are of the view that this aspect needs consideration and simplification of procedure for recruitment of Class IV staff and elimination of undue restraints in this behalf would be a step in the right direction.

(Para 279)

(123) There was unanimity in the views furnished by the Railways and the evidence tendered before us emphasising the need for giving weightage to the sons of railway employees for recruitment to Railway service in order to ensure loyalty and efficiency through continuity of tradition of service. We shall advert to this in Part II of our Report.

(Para 282)

(124) We find that the Northern Railway has fixed the percentages for direct recruitment in case of traffic apprentices and assistant signal and block inspectors higher than the respective percentages prescribed by the Railway Board. The Railway has not furnished any reason for adopting the enhanced percentages.

(Para 286)

(125) We find that the Railways have in several cases made direct recruitment in certain categories in excess of the percentages prescribed by the Railway Board. In our view, direct recruitment should be regulated judiciously so that reasonable chances of promotion of staff already in service are not diminished in a particular year as is likely to be the case if an attempt is made to clear the accumulated deficiencies in one or two years.

(Paras 287—289)

(126) We consider that for an administration to run efficiently and successfully, the position and morale of supervisors are matters of utmost importance.

(Para 294)

(127) We find wide variations in the jurisdictions of the various categories of supervisors on the different Railways. Very little seems to have been accomplished to bring about a measure of uniformity in the jurisdiction of inspectors over the various Railways. In our view, the evolving of yardsticks and their application with local adjustments, as may be considered necessary, is essential.

(Paras 298-299)

(128) In our view, the programme of personalised training on man-to-man basis needs to be re-oriented with an emphasis on the personal contact and understanding between the officer or supervisor and the individual worker and specific individual attention to the latter.

(Para 307)

(129) We find that the investigations conducted by the Psycho-Technical Cell are still in an experimental stage. We consider that if the value of psycho-technology as a means to promote safety in train operation has been recognised by the Railway Board, every thing possible should be done to accelerate the process. We hope that when the stage arrives for the application of these tests in the selection of personnel, such tests will be handled by well qualified and responsible staff so that they become neither a mere routine nor a source of harassment to the staff.

(Para 310)

(130) We find that nearly 60 per cent of the employees held responsible for causing two or more accidents were in the category of drivers. In our view, this study may provide a pointer for psychological counselling and rational persuasion of these and other staff so that in future they may be able to render a relatively accident free service.

(Para 311)

(131) We find that in spite of the fact that the strength of staff has increased practically in all categories, the percentage of those provided with railway quarters has also kept pace and in the case of some categories the position has shown definite improvement. We, however, feel that a lot more remains to be done. We consider that in case of railway staff concerned with train operation, the provision of railway quarters is a matter of necessity rather than an amenity and would prove conducive to increasing the element of safety in train operation.

(Paras 316—318)

(132) The morale of officers and the impact it has on the running of an organisation are indeed matters to which we attach great importance. Instances of intervention by influential outsiders in routine decisions taken by officers were brought to our notice. We agree that such factors inevitably tell on the morale of officers and their disposition to take right decision. We intend to give further thought to this in Part II of our Report.

(Para 321)

(133) We find that the time taken in the finalisation of accident cases on some of the Railways is far beyond the targets laid down by the Railway Board. In particular, the long interval of time between the date of finalisation of accident enquiry and the acceptance of findings by competent authority is difficult to appreciate.

(Para 325)

(134) While there is no gainsaying the fact that the present procedure of disciplinary action by its very nature is cumbersome and time-consuming, we find, as a result of a case study of some accidents, that there is not much substance in the widely held notion that the errant employees often resort to dilatory tactics. Our case studies show that if any thing, it is more the incidental delays occurring in the departmental office itself which account for the major portion of the delays. We consider that there is scope for considerable improvement if such delays in the processing of the case in the departmental offices are minimised.

(Para 327)

(135) We consider that it would be advantageous if a provision is made in Section 101 of the Indian Railways Act to the effect that no court shall take cognisance of an offence under this Section and the cognate sections of the Indian Penal Code without the sanction of the authority who is entitled to remove the railway servant from office. Such authority would be in the best position to determine whether there should be a prosecution and if so who should be prosecuted. Where the police authorities feel that the competent authority is withholding sanction wrongly, they can always approach the Railway Ministry for getting the necessary sanction.

(Paras 337 & 338)

(136) We would like to think that in most accident cases, departmental action would meet the ends of justice and prosecutions of railway staff would be necessary only in a comparatively few cases of a serious nature.
(Para 340)

Safety organisation, rules and other operating matters

(137) We are informed that the functions performed by the Safety Organisation are in the nature of "internal audit" on the aspects concerning safety in train operation and are highly useful and important.
(Para 343)

(138) We have been advised that the Railway Board have appointed a Committee of officers recently to go into the general rules with a view to revising and simplifying these. We hope that the views expressed by the Kunzru Committee about the multiplicity of rules and the need for standardising the working practices will be kept in view while revising the rules.
(Paras 347 & 348)

(139) In our view the minimum distance necessary for the protection of a trolley or a lorry should be uniform on all Railways.
(Para 353)

(140) We find that from the anomalies and the deficiencies in the Working Time Tables of the Railways pointed out by the Kunzru Committee still persisted in the April 1968 issues. We urge that the Working Time Tables should be subjected to a thorough scrutiny before issue so that such anomalies and deficiencies do not recur.
(Paras 357 & 358)

Permanent way

(141) We commend the progress made on track renewals and hope that the pace of renewals will be maintained. We hope that the speed restrictions attributable to worn or obsolete track will continue to be eliminated.
(Para 364)

(142) We hope that the pace of welding of rails would be maintained, and even further accelerated.
(Para 367)

(143) We find that there is an overall shortfall in the procurement of wooden sleepers on both the broad and the metre gauges over the past four years. We suggest that through renewals of wooden sleepers on non-track-circuited section may be carried out with CST-9, or steel trough and prestressed cement concrete sleepers and the released serviceable second hand wooden sleepers used for random renewals.
(Paras 371 & 372)

(144) We are unable to appreciate the reasons for the administration's inability to develop the concrete sleepers to suit Railways' special requirements over the last many years. We urge the Railway administration to make special efforts for introducing the pre-stressed concrete sleepers on the Railways on an extensive scale in view of the unfavourable supply position of wooden sleepers and their increasing demand for modern signalling.
(Para 375)

(145) We feel that greater efforts are called for to enhance the procurement of clean ballast from 5 to 9 million cubic metres per annum.

(Para 383)

(146) We consider that the curve alignment register should embody the physical characteristics of each curve and first two or three columns should contain the correct versine and super-elevation figures against each 'station'.

(Para 384)

(147) In our view the replacement of the mate's diary by the 'gang inspection register' was quite unnecessary. We are informed that instructions have since been issued dispensing with 'gang inspection register'.

(Para 386)

(148) We consider it important that the results of the trials of the improved methods of track maintenance, like 'measured shovel packing', 'directed maintenance', etc. are assessed early so that the Railways may be in a position to modernise their methods of maintenance of permanent way.

(Para 392)

(149) We presume that no serious difficulty is being experienced with the use of 'on track' automotive tie tampers on the trunk routes and main lines. We feel that the output of tie tamping and ballast cleaning machines, compared to the current manual methods, would justify their continued use.

(Para 395)

(150) We consider it necessary that the Assistant Engineer concerned should invariably be associated with the testing of the track by the Hallade track recorder and that the charts should be documented at the end of the day's run and defects listed for prompt action by sectional permanent way inspector.

(Para 398)

(151) We suggest that the construction and the equipment of the test cars should be completed on priority and that at least one test car for the metre gauge should be made available, as soon as possible.

(Para 401)

(152) We find that the R.D.S.O. was asked to look into the question of track recording trollies only recently—in April 1968. It seems that action on this part of the recommendation of the Kunzru Committee had not been taken earlier. We understand that the proposal has since been given up.

(Para 402)

Level crossings

(153) While we agree that it is not necessary to provide a rigid standard or yardstick, we do feel that some norm should be fixed for all Railways which may help them in deciding whether a particular unmanned level crossing should be manned and whether a manned level crossing requires upgrading.

(Para 406)

(154) We are of the view that the five-yearly censuses should not be given up.

(Para 407)

(155) We understand that the Railway Safety Works Fund was started sometime ago. We were advised that there had been hardly any expenditure out of this fund, primarily because the existing procedure for the operation of the Safety Works Fund is cumbersome.

(Paras 409 & 410)

(156) We suggest that some procedure should be evolved by which 10 per cent of the amount in this Fund should be earmarked for manning the unmanned level crossings and upgrading of the manned level crossings and the Railway administration should be authorised to draw directly from this fund upto this amount for this purpose.

(Para 411)

(157) We also suggest that the remainder of the Fund, i.e., 90 per cent should also be utilised to the best advantage by providing road overbridges or under-bridges which would, undoubtedly, help in reducing the number of level crossing accidents.

(Para 412)

(158) We do not consider that undulations and bumps on approaches to unmanned level crossings would have any advantage. We, therefore, do not think this matter need be pursued further.

(Para 414)

(159) We consider the amendment to Motor Vehicles Act in States making it obligatory for drivers of passenger buses before passing an unmanned level crossing to stop and to cross them with the conductor of the bus walking ahead of the bus a wise provision and hope that the violation of this provision of the Law would be sternly viewed and the offenders brought to book.

(Para 415)

(160) We consider that the basic object of interlocking of gates with signals is to ensure the safety of road traffic and it should be provided where the road traffic is heavy. We do not subscribe to the view that the measure of safety provided by the installation of warning bells is as good as that by interlocking gates with signals.

(Para 422)

(161) We find that 24 per cent of the works involving interlocking of gates with signals still remain to be completed though the Railway Board had directed the Railways to complete these works during the Third Five Year Plan on a priority basis. The Board's directive seems to have gone partly unheeded.

(Para 423)

(162) We are advised that the Railway Board do not consider the automatic half barrier suitable for Indian conditions and that the experiment may be taken as no longer alive.

(Para 428)

(163) In our view, it is desirable that the responsibility for avoiding accidents should rest with the road users in the case of unmanned level crossings. We would not, therefore, advocate installing of bells and road flasher signals as it would result in unnecessary waste of money without comparable advantage in the matter of avoiding accidents in our conditions.

(Para 429)

Signalling

(164) The assurance given by the Railway Board that all signalling and interlocking works brought forward from Second Five Year Plan and those included in the Works Programmes during the first three years of the Third Five Year Plan would be completed by the end of the Third Five Year Plan has not been completely fulfilled. The factors enumerated for delay cannot be deemed as unanticipated or such as could not be visualised, at the time of planning and programming these works.

(Paras 431—434)

(165) We find that there are a number of stations on the broad and the metre gauges which have not been provided with rudimentary interlocking though the Railway Board had directed the Railways to complete this work by 31-3-1964. We hope that this safety provision will be completed in a short time.

(Paras 436 to 439)

(166) We find that a number of stations on the double line on some Railways are either not provided with block instruments or are provided with block instruments with control on last stop signals only and not complete lock and block working. We feel that the recommendation of the Kunzru Committee in this behalf should have been fully implemented long ago in the interests of safety.

(Paras 441 to 443)

(167) We find that only 41 per cent of the number of stations programmed to be provided with multiple aspect signalling of the upper quadrant or colour light type on 31-3-64, have been so provided.

(Para 446)

(168) We consider the achievements in respect of the provision of modern techniques of signalling to be inadequate in view of the increasing speed and density of traffic. In our view, the recommendation of the Kunzru Committee assumes urgency with the increasing introduction of diesel and electric traction and running of heavier trains at higher speeds. We urge that special efforts should be made to accelerate the progress in the use of modern signalling techniques.

(Para 450)

(169) We note that the rate of progress in the provision of track circuiting so far has been slow. Judging from the performance of the last five years, it is obvious that unless energetic steps are taken to improve the pace of execution of track circuiting works, the target of 200 stations per year, set by the Board, may not be achieved. We consider that the introduction of track circuiting at stations is an important step towards ensuring safety in train working.

(Paras 455-456)

(170) In our view, the progress of efforts towards adoption of Automatic Train Control, on which the Kunzru Committee had laid stress, has been slow. We feel that had the trials and installation of Automatic Train Control been initiated earlier, certain signalling firms in India would have become interested in this field of manufacture already.

(Paras 459-460)

(171) We find that the incidence of failures of signalling and interlocking gears, after a marked decrease in 1963-64, has been steadily increasing every year. The same pattern is discernible in case of failures of block instruments, where, however, a reversal of the trend is noticed during 1967-68.

(Para 464)

(172) We urge that efforts to reduce track circuit failures to the maximum extent possible should be intensified.

(Para 467)

(173) We find that the shortfall in the replacement of worn out frames during 1967-68 was considerably less than in the previous years but the number of worn out block instruments in need of replacement during 1967-68 was the highest of the past five years.

(Paras 469-470)

(174) We stress the need for clearing shortfall in the overhauling and replacement programmes for lever frames and block instruments, investigating the factors responsible for failures of signalling and interlocking gears and laying down a yardstick for determining the strength of block, electric and mechanical signal maintainers.

(Para 471)

Rolling Stock

(175) We suggest that the final trial of an overhauled locomotive should be carried out, as far as possible, at a speed 5 to 10 per cent higher than the maximum permissible speed of the locomotive, and a speedometer used for the purpose.

(Para 475)

(176) We suggest that braking distance trials for graded sections on the broad gauge and for level and graded sections on the metre gauge should be carried out without delay.

(Para 484)

(177) We consider that the distance between the distant and the first stop signals on high speed routes and the length of the signalling section in automatic signalling territory should not be less than the emergency braking distance.

(Para 485)

(178) We hold the view that all locomotives working trains should be equipped with speedometers on a phased programme but it is essential that a target should be laid down in regard to the provision of this aid on all locomotives.

(Para 489)

(179) (i) We find that during 1967-68 the majority of the Railways were unable to achieve the target laid down for the broad and the metre gauges in respect of engine failures. (ii) We notice that the performance on the Western, the Eastern and the Southern Railways on the broad gauge and the Central, the Northeast Frontier and the North Eastern Railways on the metre gauge was much below the target.

(Paras 493 & 494)

(180) The need to improve the performance of diesel and electric engines is indicated.

(Para 496)

(181) We find that the handbooks for drivers in use on the Eastern and the Northern Railways do not contain information about the defects likely to develop on engines on the run. The Northeast Frontier Railway has yet to bring out a handbook for drivers.

(Para 497)

(182) The overaged locomotives on the metre gauge need further attention in maintenance in order to improve their performance.

(Para 502)

(183) We consider the adoption of a uniform basis for fixing the time schedule for train examination and for determining the strength of examining gangs by all the Railways not only available but essential for the proper examination of trains and urge that any further delay in implementing the Kunzru Committee's recommendations should be avoided.

(Para 511)

(184)(i) In our view, the Central and the North Eastern Railways should devote greater attention to the maintenance of rolling stock in their depots.

(ii) The results of spot checks by Neutral Control Flying Squad for 1967-68 highlight the deficiencies in train examination which should be speedily removed.

(Paras 513 and 515)

(185) The increasing incidence of hot boxes on coaching stock on both the gauges over the last three years is a pointer to the need for the effective implementation of the recommendations of the Director, Research (Hot Boxes) and a further critical study, if necessary.

(Para 521)

(186) We note a marked improvement in the incidence of hot boxes on goods stock on the broad gauge.

(Para 523)

(187) There was an overall reduction in the number of coaches and wagons overdue periodical overhaul on Indian Railways as compared to the position obtaining on 31-3-63, the position in respect of coaches on the North Eastern and the Northeast Frontier Railways was however unsatisfactory. We urge that efforts to reduce the number of coaches and wagons overdue periodical overhaul still further should continue.

(Paras 530, 531 & 533)

(188) We note that there has been a marked reduction in overaged coaches on both the broad and the metre gauges.

(Para 538)

(189) There has been a reduction in the number of overaged wagons on the broad gauge but there has been a notable increase in the number of such wagons on the metre gauge. We urge the Railways to make sustained efforts to reduce the number of overaged wagons particularly on the metre gauge.

(Para 539)

(190) We note that there has been an improvement in respect of passenger train partings on both the gauges. There has also been a considerable improvement in the incidence of goods train partings on the broad gauge and a slight improvement on the metre gauge. We hope that the measures which brought about the improvement in the position of train partings will be sustained and intensified.

(Paras 544, 546 & 548)

Stores, post-accident relief measures and other matters

(191) We consider that though there has been some improvement in the availability of stores, there is considerable scope for further improving the position.

(Para 552)

(192) In our view, the over-dependence of the Ministry of Railways on the Directorate General of Supplies and Disposals for their requirements and the effect this has on the availability and procurement of stores is a matter of considerable concern.

(Para 555)

(193) We find that while the extant rules do not preclude non-acceptance of the lowest tender if it is otherwise not acceptable, in practice such discretion is rarely used in favour of reliable firms. We feel that a bolder attitude in such cases will be in public interest.

(Para 556)

(194) We found that some of the Railways were ignorant of the existence of the standardised lists of safety items of stores as prescribed by the Railway Board. We hope, the Railway Board would clarify the position to the Railways.

(Para 558)

(195) We consider that inventory control in an enormous undertaking like the Indian Railways is a vital factor. It is apparent that modern methods will have to replace many of the old stores procedures.

(Para 559)

(196) It would appear that the measures suggested to prevent tampering with track have proved ineffective. We are not unaware of the complex and difficult nature of this problem. We would urge that the steps for the security of the track against the dangers posed by the saboteurs will have to be persevered in and implemented with vigour. In our view, there must be close and continuous coordination between the Ministry of Home Affairs, State Governments and the Railways if the designs of the saboteur are to be kept under restraint if not thwarted.

(Para 566)

(197) We find that the work of rewiring of some coaches according to the revised wiring circuit remains to be completed on the Western Railway.

(Para 568)

(198) We hope that the Kunzru Committee's recommendations in regard to the replacement of 4-wheeler medical vans with the bogie medical vans will be fully implemented within the shortest possible time.

(Paras 572-573)

(199) We hope that special efforts will be made to complete the work in regard to the provision of sidings with double ends for stabling medical relief vans; this work has been outstanding for the last three years or so.

(Paras 574-575)

(200)(i) We are sorry to observe that despite the Kunzru Committee's exhortation and the urgency of the matter no definite policy has been formulated by the Government in regard to the narrow gauge lines and this vital issue is still crying for a solution.

(Para 578)

(ii) We recommend that the action taken by the British Government in a not dissimilar situation, should be taken by our government with a view not only to ascertaining the facts which may broadly be already known to the Railway administrations but also in educating and mobilising public opinion on the subject.

(Para 579)

CHAPTER V—RESEARCH DESIGNS AND STANDARDS ORGANISATION (RDSO)

(201) We find that the work done in the RDSO in recent years has been notable and we would like to record our appreciation.

(Para 581)

(202) We suggest that formal planning and allocations of resources should be arranged well in advance in respect of important items to avoid time lags.

(Para 584)

(203) We feel that the recommendation of the Kunzru Committee regarding the bifurcation of the research organisation into two separate research directorates is no longer a live issue as the range of expansion of the RDSO during the last five years has more than covered the field that the Kunzru Committee had in mind.

(Paras 585 and 587)

(204) We consider that the equipment and capacity of non-railway research and technical bodies including Universities to undertake the solution of problems peculiar to Railways is very limited in India.

(Para 589)

(205) We agree that a 12 monthly frequency for meetings of the Central Board of Railway Research seems justified. We note that a three-year tenure of membership of this body has been adopted.

(Para 592)

(206) We find that the delays in finding solutions to certain problems highlighted by the Kunzru Committee have in most cases been overcome. We would stress that there should be no slackening of efforts for still further improvements, particularly towards greater safety in all aspects of railway working. We consider that in the case of sophisticated and costly items, special measures including utilising the most expert advice obtainable are called for.

(Para 594)

(207) We have satisfied ourselves that the Railway Board have given full weightage to the observations made by the Kunzru Committee for modernising the techniques regarding the design and building of bridges.

(Para 597)

(208) We find that there is a separate directorate in the RDSO which handles all aspects of signalling and is currently engaged in introducing several modern developments.

(Para 599)

(209) The need for Railways to collaborate technically with foreign firms in the manufacture of electrical and signalling equipment in India is no longer as great as before due to growing industrialisation in both the public and private sectors.

(Para 599)

(210) We find that the RDSO had already been expanded and better equipped during the past five years and that further steps are in progress for its future growth. We favour its being looked upon as a standing Task Force.

(Paras 602 and 603)

(211) In our view, the prescribing of a rigid percentage to be spent on the RDSO is not a feasible proposition. We agree that rigid sub-division of budgetary allotments between the various sections within the RDSO are also unnecessary.

(Paras 604 & 605)

(212) We accept the view that suitability for discharging their duties efficiently plus some flair for designing and research should be the criterion for selecting railway officers for the RDSO. We urge that the Railway Ministry should do its best to staff the RDSO with the most suitable men available.

(Paras 606, 607 & 608)

(213) We think that a period of 4 to 5 years should be the normal tenure of officers in the RDSO. We would leave the age of superannuation to be considered in the wider context of public and 'service' considerations.

(Paras 608 & 609)

(214) We agree with the Railways that the creation of a liaison organisation in the RDSO for the purpose of carrying out test checks on the quality of maintenance and standards of manufacture of railway equipment on the Railways will tend to dilute the responsibility already placed on supervisory and inspecting authorities and also result in some duplication.

(Paras 610 & 611)

(215) We agree with the Kunzru Committee that the Documentation Section needs to be adequately expanded and modernised. We hope that the Railway Board would adopt a suitable policy speedily.

(Para 614)

(216) We consider that an early revival of the liaison between the RDSO and the manufacturers of railway equipment is very much in the interests of the Railways themselves.

(Para 615)

(217) We recommend that the results of the performance research studies, under actual working conditions, be carefully examined by the Railway Board, at Directors' and higher levels for improving the standard servicing and maintenance practices on Zonal Railways.

(Para 617)

(218) We agree with the Kunzru Committee that we should not hesitate to import equipment which is not readily available in the country as otherwise we shall be depriving ourselves of the most progressive and up-to-date ideas embodied in such equipment.

(Para 618)

(219) We feel that there will be considerable advantage if experts in safety measures answering well on railways in advanced countries, can be invited to visit Indian Railways in the near future to give their appreciation of the present position and of how train operation can be made safer.

(Para 620)

(220) We find that the Railway Board have accepted the recommendations of the Kunzru Committee regarding the status and powers of the Director General of the RDSO.

(Para 621)

(221) We suggest that the tenure recommended for other responsible posts in the R.D.S.O. should also apply to its head, who should always be closely associated with the selection of individuals to fill important posts in the organisation.

(Para 621)

(222) We express our appreciation of the detailed examination by the Kunzru Committee of various aspects of the R.D.S.O. and are of the view that many of the improvements made during the past five years in this organisation are largely due to this factor.

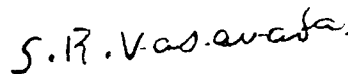
(Para 622)



K. N. WANCHOO
Chairman



M. R. MASANI, M.P.
Member



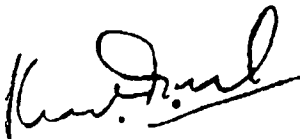
S. R. VASAVADA, M.P.
Member



F. C. BADHWAR
Member



P. B. AIBARA
Member



K. D. MADAN
Secretary

NEW DELHI,
25th November, 1968

ANNEXURE I

COMPARATIVE INCIDENCE OF COLLISIONS—RAILWAY-WSIE

Railway	Incidence of collisions during six years 1957-58 to 1962-63		Incidence of collisions during last five years 1963-64 to 1967-68	
	Number	Incidence per million train kilometres	Number	Incidence per million train kilometres
Central	112	0.27	54	0.16
Eastern	133	0.44	39	0.14
Northern	104	0.27	53	0.15
North Eastern	71	0.42	31	0.22
Northeast Frontier	33	0.32	29	0.33
Southern	76	0.21	62	0.19
South Central .. .. .	..	..	6	0.09
South Eastern	88	0.43	66	0.30
Western	71	0.21	40	0.12
All Railways	688	0.29	380	0.18
Average per year	115		76	

NOTES :

(i) The South Central Railway was formed on 2-10-1966.

(ii) The Northeast Frontier Railway was formed in January, 1958.

ANNEXURE II

INCIDENCE OF TRAIN COLLISIONS—YEAR-WISE

Year	Broad Gauge		Metre Gauge	
	Number of Train Collisions	Incidence of collisions per million train kilometres	Number of Train Collisions	Incidence of collisions per million train kilometres
1957-58	96	0.41	29	0.25
1958-59	75	0.32	32	0.27
1959-60	78	0.32	31	0.25
1960-61	108	0.43	20	0.18
1961-62	82	0.32	38	0.30
1962-63	76	0.28	23	0.18
Total	515	0.35	173	0.23
1963-64	58	0.21	25	0.18
1964-65	54	0.19	29	0.21
1965-66	58	0.20	21	0.14
1966-67	51	0.17	16	0.11
1967-68	48	0.16	20	0.14
Total	269	0.18	111	0.16

ANNEXURE III

COMPARATIVE INCIDENCE OF TRAIN COLLISIONS—RAILWAY-WISE

Railway	Broad Gauge				Metre Gauge			
	Number of Train Collisions		Incidence per million train kilometres		Number of Train Collisions		Incidence per million train kilometres	
	1957-58	1963-64	1957-58	1963-64	1957-58	1963-64	1957-58	1963-64
	to 1962-63	to 1967-68	to 1962-63	to 1967-68	to 1962-63	to 1967-68	to 1962-63	to 1967-68
Central	110	52	0.28	0.17	2	2	0.05	0.08
Eastern	133	39	0.44	0.14	..	..	..	..
Northern	95	43	0.30	0.15	9	10	0.14	0.15
North Eastern .. ..	..	1	..	0.85	71	30	0.42	0.20
Northeast Frontier .. ..	..	3	..	0.26	33	26	0.32	0.33
Southern	51	35	0.32	0.26	25	27	0.11	0.14
South Central .. ..	..	2	..	0.06	..	4	..	0.15
South Eastern	88	66	0.42	0.30	..	..	..	..
Western	38	28	0.21	0.18	33	12	0.19	0.08
All Railways	515	269	0.35	0.18	173	111	0.23	0.16

ANNEXURE IV

TYPES OF COLLISIONS (BROAD GAUGE)

Year	Between two trains including light engines		Between a train and shunting engine, etc.		Between a train and trolley or lorry		Between a train and buffer stops or other stationary objects	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
1957-58	35	36.5	48	50.0	12	12.5	1	1.0
1958-59	21	28.0	34	45.4	19	25.3	1	1.3
1959-60	14	18.0	45	57.7	19	24.3	..	..
1960-61	23	21.3	46	42.6	31	28.7	8	7.4
1961-62	24	29.3	25	30.5	29	35.3	4	4.9
1962-63	31	40.8	19	25.0	20	26.3	6	7.9
Total	148	28.7	217	42.2	130	25.2	20	3.9

ANNEXURE IV—*contd.*

Year	Between two trains including between a train and light engine		Between a train and shunting engine or vehicles during shunting		Between a train and rake or load or vehicles stabled on running line		Between a train or a trolley or lorry		Between a train and buffer ends or other stationary objects	
	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage
1963-64	31	53.5	12	20.7	11	18.9	3	5.2	1	1.7
1964-65	31	57.4	13	24.1	..	..	9	16.7	1	1.8
1965-66	25	43.1	10	17.2	9	15.5	11	18.9	3	5.2
1966-67	25	49.0	6	11.8	7	13.7	7	13.7	6	11.8
1967-68	24	50.0	7	14.6	7	14.6	10	20.8	..	..
Total	136	50.6	48	17.8	34	12.6	40	14.9	11	4.1

ANNEXURE V

TYPES OF COLLISIONS (METRE GAUGE)

Year	Between two trains including light engines		Between a train and shunting engine etc.		Between a train and trolley or lorry		Between a train and buffer stops or other stationary objects	
	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage
1957-58	7	24.1	17	58.6	4	13.8	1	3.5
1958-59	11	34.4	19	59.4	2	6.2	..	..
1959-60	10	32.3	11	35.4	10	32.3	..	..
1960-61	10	50.0	5	25.0	5	25.0	..	..
1961-62	16	42.1	13	34.2	9	23.7	..	..
1962-63	11	47.8	9	39.1	3	13.1	..	..
Total	65	37.6	74	42.8	33	19.0	1	0.6

Year	Between two trains including between a train and light engine		Between a train and shunting engine or vehicles during shunting		Between a train and rake or load or vehicles stabled on a running line		Between a train or a trolley or lorry		Between a train and buffer ends or other stationary objects	
	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage
1963-64	9	36.0	6	24.0	7	28.0	2	8.0	1	4.0
1964-65	8	27.6	6	20.7	7	24.1	8	27.6	..	..
1965-66	13	61.9	2	9.5	5	23.8	1	4.8	..	..
1966-67	5	31.2	5	31.2	2	12.5	3	18.8	1	6.3
1967-68	8	40.0	3	15.0	4	20.0	4	20.0	1	5.0
Total	43	38.8	25	19.8	25	22.5	18	16.2	3	2.7

ANNEXURE VI

TYPES OF COLLISIONS—YEAR-WISE SEPARATELY FOR PASSENGER AND GOODS TRAINS

Year	Between two trains including between a train and light engine				Between a train and a shunting engine or Vehicles during shunting				Between a train and rake or load or vehicles stabled on a running line				Between a train and buffer ends or other stationary objects				Between a train and a trolley or lorry				
	Passenger		Goods		Passenger		Goods		Passenger		Goods		Passenger		Goods		Passenger		Goods		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1963-64	..	10	41.7	30	50.9	2	8.3	16	27.1	7	29.2	11	18.6	2	8.3	..	..	3	12.5	2	3.4
1964-65	..	13	50.0	26	45.7	5	19.2	14	24.5	2	7.7	5	8.7	..	..	1	1.7	6	23.1	11	19.4
1965-66	..	16	44.5	22	51.1	6	16.7	6	14.0	5	13.9	9	20.9	1	2.7	2	4.7	8	22.2	4	9.3
1966-67	..	11	55.0	19	40.4	2	10.0	9	19.1	2	10.0	7	15.0	4	20.0	3	6.4	1	5.0	9	19.1
1967-68	..	19	54.3	13	39.4	3	8.6	7	21.1	5	14.5	6	18.2	1	2.8	..	..	7	20.0	7	21.1
Total	..	69	48.9	110	46.0	18	12.8	52	21.8	21	14.9	38	15.9	8	5.7	6	2.5	25	17.7	33	13.8

ANNEXURE VII

TYPES OF COLLISIONS—RAILWAY-WISE

Railway	Between two trains including between a train and light engine				Between a train and shunting engine or vehicles during shunting				Between a train and rake or load or vehicles stabled on a running line				Between a train and buffer ends or other stationary objects				Between a train and a trolley or lorry					
	B.G.		MG		BG		MG		PG		MG		BG		MG		BG		MG			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Central	..	22	16.2	1	2.3	8	16.6	1	4.6	12	35.3	..	..	4	36.4	..	..	6	15.0	..	..
Eastern	..	25	18.4	..	..	4	8.3	..	..	4	11.8	..	..	4	36.4	..	..	2	5.0	..	..
Northern	..	17	12.5	3	7.0	9	18.8	2	9.1	10	29.3	5	20.0	1	9.1	..	..	6	15.0	..	..
North Eastern	16	37.1	1	2.0	4	18.1	..	..	6	24.0	..	..	1	33.3	..	..	3	16.7	
Northeast Frontier	2	1.5	6	14.0	8	36.3	7	28.0	1	33.3	1	2.5	4	22.2
Southern	..	11	8.1	10	23.3	5	10.5	5	22.8	4	11.8	5	20.0	..	..	1	33.4	15	37.5	6	33.3
South Central	..	1	0.7	..	..	1	2.0	..	..	..	..	..	..	..	..	..	..	..	..	4	22.2
South Eastern	..	42	30.8	..	..	14	29.3	..	..	2	5.9	..	..	..	..	..	..	8	20.0	..	..
Western	..	16	11.8	7	16.3	6	12.5	2	9.1	2	5.9	2	8.0	2	18.1	..	..	2	5.0	1	5.6
TOTAL	136	..	43	..	48	..	22	..	34	..	25	..	11	..	3	..	40	..	18	..	

ANNEXURE IX

CAUSES OF COLLISIONS -RAILWAY-WISE AND GAUGE-WISE

Railway	Reception of a train on a blocked line or despatching it into a blocked section		Drivers dis-regarding signals or failing to control trains		Trolleys or Lorries not protected		Miscellaneous	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
Central	36	1	9	..	4	..	3	1
Eastern	11	..	23	..	2	..	3	..
Northern	27	9	14	1	1	..	1	..
North Eastern ..	1	13	..	13	..	2	..	2
Northeast Frontier	2	18	..	6	1	2	..	..
Southern	15	16	5	4	12	4	3	3
South Central ..	1	..	1	..	..	4	..	..
South Eastern ..	35	..	24	..	6	..	1	..
Western	16	6	10	5	2	1	..	..
Total	144	63	86	29	28	13	11	6

ANNEXURE IX

INCIDENCE OF COLLISIONS ACCORDING TO SPEED FACTOR

Particulars of trains	Number of collisions	
	No.	Percentage
<i>Broad gauge</i>		
A. Passenger trains		
(i) Trains with a booked speed of 50 kilometres per hour or less	15	15.8
(ii) Trains with a booked speed of over 50 k.m.p.h. and upto 75 k.m.p.h.	56	58.9
(iii) Trains with a booked speed of over 75 k.m.p.h.	24	25.3
TOTAL	95	
B. Goods trains		
(i) Trains with a booked speed of 50 k.m.p.h. or less	86	49.4
(ii) Trains with a booked speed of over 50 k.m.p.h. and up to 75 k.m.p.h.	88	50.6
TOTAL	174	
<i>Metre gauge</i>		
C. Passenger trains		
(i) Trains with a booked speed of 50 k.m.p.h. or less	28	60.9
(ii) Trains with a booked speed of over 50 k.m.p.h. and upto 75 k.m.p.h.	18	39.1
TOTAL	46	
D. Goods trains		
(i) Trains with a booked speed of 40 k.m.p.h. or less	52	80.0
(ii) Trains with a booked speed of 40 k.m.p.h. and upto 50 k.m.p.h.	13	20.0
(iii) Trains with a booked speed of over 50 k.m.p.h. .. ..	..	..
TOTAL	65	

ANNEXURE X

DERAILMENTS AT STATIONS AND IN MID-SECTION—RELATIVE INCIDENCE

1957-58 to 1962-63										1963-64 to 1967-68										
Railway	Broad gauge					Metre gauge					Broad gauge					Metre gauge				
	Mid-Sec.		Station			Mid-Sec.		Station			Mid-Sec.		Station			Mid-Sec.		Station		
	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age	No.	Per cent-age		
Central	142	14.7	834	85.3	95	64.6	52	35.4	108	22.6	369	77.4	28	66.7	14	33.3		
Eastern	91	15.7	487	84.3	..	..	..	..	74	35.6	134	64.4	..	..	..	..
Northern	78	12.9	526	87.1	167	43.4	218	56.6	105	30.1	244	69.9	107	54.9	88	45.1		
North Eastern	176	13.9	1093	86.1	..	..	1	100.0	138	20.5	535	79.5		
Northeast Frontier	4	44.4	5	55.6	194	27.5	510	72.5	9	21.4	33	78.6	313	45.3	378	54.7		
Southern	60	12.6	416	87.4	519	53.1	458	46.9	64	17.0	315	83.0	220	43.1	290	56.9		
South Central	11	23.4	36	76.6	32	43.8	41	56.2		
South Eastern	200	27.8	518	72.2	..	..	..	..	197	37.1	335	62.9	..	..	..	..
Western	35	14.0	215	86.0	262	53.2	231	46.8	27	20.5	105	79.5	137	41.1	197	58.9		
ALL RAILWAYS	610	16.9	3001	83.1	1413	35.5	2562	64.5	595	27.4	1572	72.6	975	38.8	1543	61.2		

ANNEXURE XI

INCIDENCE OF DERAILMENTS—PASSENGER AND GOODS TRAINS—YEAR-WISE

Year	Broad gauge				Metre gauge			
	Passenger Trains		Goods Trains		Passenger Trains		Goods Trains	
	No.	Incidence per million passenger train kilometres	No.	Incidence per million goods train kilometres	No.	Incidence per million passenger train kilometres	No.	Incidence per million goods train kilometres
1963—64 ..	56	0.41	567	4.4	73	0.99	520	10.4
1964—65 ..	66	0.49	386	3.1	64	0.83	441	8.6
1965—66 ..	68	0.48	318	2.4	61	0.77	447	8.4
1966—67 ..	66	0.46	272	2.1	67	0.82	396	7.6
1967—68 ..	73	0.50	295	2.0	84	1.0	365	7.7
TOTAL ..	329	0.47	1,838	2.8	349	0.88	2,169	8.5

ANNEXURE XII

INCIDENCE OF DERAILMENTS—PASSENGER AND GOODS TRAIN—GAUGE-WISE AND RAILWAY-WISE

Railway	Broad gauge				Metre Gauge			
	Passenger Trains		Goods Trains		Passenger Trains		Goods Trains	
	No.	Incidence per million passenger train kilometres	No.	Incidence per million goods train kilometres	No.	Incidence per million passenger train kilometres	No.	Incidence per million goods train kilometres
Central ..	60	0.45	417	2.8	8	0.64	34	3.8
Eastern ..	51	0.38	157	1.3	..	..	..	..
Northern ..	90	0.55	259	2.3	35	0.99	160	5.8
North Eastern	1	0.88	..	..	91	1.0	582	13.3
Northeast Frontier	9	1.7	33	6.8	85	2.3	606	20.5
Southern ..	54	0.68	325	6.5	81	0.65	429	6.9
South Central	9	0.47	38	2.5	9	0.61	64	5.8
South Eastern	41	0.54	491	4.0	..	..	..	..
Western ..	14	0.16	118	1.6	40	0.49	294	3.9
TOTAL ..	329	0.47	1,838	2.8	349	0.88	2,169	8.5

ANNEXURE XIII

INCIDENCE OF PASSENGER AND GOODS TRAIN DERAILMENTS—AT STATIONS AND IN MID-SECTION—
RAILWAY-WISE

Railway	Broad gauge						Metre gauge											
	Passenger Trains			Goods Trains			Passenger Trains			Goods Trains								
	Station		Mid Section	Station		Mid Section	Station		Mid Section	Station		Mid Section						
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%						
Central	35	16.4	25	21.6	33.4	24.6	83	17.3	5	2.8	3	1.8	9	0.7	25	3.1
Eastern	33	15.5	18	15.5	101	7.4	56	11.7	..	..	..	..	..	..	..	..
Northern	59	27.7	31	26.7	185	13.7	74	15.5	15	8.3	20	11.8	73	5.4	87	10.8
North Eastern	1	0.5	..	..	..	..	..	..	63	35.0	28	16.6	472	34.6	110	13.6
Northeast Frontier	5	2.3	4	3.5	28	2.1	5	1.0	34	18.9	51	30.2	344	25.2	262	32.5
Southern	44	20.7	10	8.6	271	20.0	54	11.3	46	25.6	35	20.7	244	17.9	185	23.0
South Central	7	3.3	2	1.7	29	2.1	9	1.9	2	1.1	7	4.1	39	2.8	25	3.1
South Eastern	21	9.9	20	17.2	314	23.0	177	36.9	..	..	..	..	..	..	..	..
Western	8	3.7	6	5.2	97	7.1	21	4.4	15	8.3	25	14.8	182	13.4	112	13.9
TOTAL	213	100.0	116	100.0	1359	100.0	479	100.0	180	100.0	169	100.0	1363	100.0	806	100.0

ANNEXURE XIV

DERAILMENTS AT STATIONS ACCORDING TO MAIN CAUSES ON THE RAILWAYS DURING THE YEARS 1963-64 TO 1967-68 IN JUXTAPosition WITH CORRESPONDING FIGURES FOR 1957-58 TO 1962-63

BROAD GAUGE

1957-58 to 1962-63

1963-64 to 1967-68

Main Causes	1957-58 to 1962-63					1963-64 to 1967-68									
	Control	East-ern	North-ern	South-ern	West-ern	All Rail-ways	Central	East-ern	North-ern	North-East-ern	North-Frontier	South-ern	South-Central	South-ern	All Rail-ways
Staff failures	No. 452	219	320	174	296	99	217	44	138	1	16	165	16	167	814
A	54.2	44.9	60.8	41.8	57.1	46.1	58.8	32.8	56.5	100.0	48.4	52.4	44.6	49.9	51.8
B	28.9	14.0	20.5	11.1	18.9	6.3	26.6	5.4	17.0	0.1	2.0	20.3	2.0	20.5	100.0
Permanent way	No. 69	90	36	64	65	25	349	20	25	..	6	73	5	54	239
A	8.3	18.5	6.8	15.4	12.5	11.6	7.6	15.0	10.2	..	18.2	23.2	13.8	16.1	14.6
B	19.8	25.8	10.3	18.3	18.6	7.2	12.2	8.7	10.9	..	2.6	31.9	2.2	23.6	100.0
Carriage & Wagon defects	No. 111	82	34	34	80	37	378	66	41	..	3	31	4	81	289
A	13.3	16.8	6.5	8.2	15.4	17.2	12.6	17.9	17.3	..	9.1	9.8	11.1	24.2	18.4
B	29.4	21.7	9.0	9.0	21.2	9.7	100.0	22.8	14.1	..	1.0	10.7	1.3	28.4	100.0
Engine defects	No. 36	18	10	18	7	15	105	12	14	..	3	15	3	4	63
A	4.3	3.7	1.9	4.3	1.4	6.9	3.5	3.2	10.4	..	9.1	4.8	8.3	1.1	5.7
B	34.3	7.1	9.5	17.1	6.7	14.3	100.0	19.1	22.2	..	4.8	23.8	4.8	6.3	9.5
Miscellaneous	No. 166	70	126	126	70	39	607	46	15	..	5	31	8	29	177
A	19.8	16.0	23.9	30.3	13.6	18.2	20.2	12.5	13.5	..	15.2	9.8	22.3	8.7	9.5
B	27.3	12.9	20.8	20.8	11.5	6.4	100.0	26.0	18.6	..	2.8	17.5	4.6	16.4	100.0
Total Number of station derailments	No. 834	487	526	416	518	215	3,001	369	134	1	33	315	36	335	1,572
Percentage of failure to the total on each Railway.	27.8	16.2	17.5	13.9	17.3	7.1	100.0	23.5	15.5	..	2.1	20.1	2.3	21.3	6.7
Percentage of the failure on each Railway to the total on all Railways.															

A—Percentage of failure to the total on each Railway.

B—Percentage of the failure on each Railway to the total on all Railways.

ANNEXURE XV
MID-SECTION DERAILMENTS ACCORDING TO MAIN CAUSES ON THE RAILWAYS DURING THE YEARS
1963-64 TO 1967-68 IN JUXTAPOSITION WITH THE CORRESPONDING FIGURES DURING 1957-58 TO
1962-63
BROAD GAUGE

Main causes	1957-58 to 1962-63						1963-64 to 1967-68										
	Central	East-ern	North-ern	South-ern	South-ern	West-ern Rail-ways	Central	East-ern	North-ern	North-east Frontier	South-ern	South-ern	West-ern Rail-ways				
Staff failures .. No.	23	10	7	5	19	2	66	25	9	25	..	1	5	3	26	1	95
A	16.2	10.9	9.0	8.3	9.5	5.7	10.8	23.1	12.1	23.8	..	11.1	7.8	27.2	13.2	3.7	16.0
B	34.8	15.2	10.6	7.6	28.8	3.0	100.0	26.3	9.5	26.3	..	1.0	5.3	3.2	27.4	1.0	100.0
Permanent way failures .. No.	11	12	15	14	57	8	117	16	18	11	..	5	27	3	81	9	170
A	7.7	13.2	19.2	23.3	28.5	22.9	19.3	14.8	24.3	10.5	..	55.6	42.2	27.3	41.1	33.3	28.4
B	9.4	10.2	12.8	11.9	48.9	6.8	100.0	9.4	10.6	6.5	..	2.9	15.9	1.8	47.6	5.3	100.0
Carriage & Wagon defects .. No.	62	40	15	12	66	9	204	30	29	36	..	1	19	3	50	10	178
A	43.7	43.9	19.2	20.2	33.0	25.7	33.4	27.8	39.2	34.3	..	11.1	29.7	27.3	25.4	37.1	30.0
B	30.4	19.6	7.4	5.9	32.3	4.4	100.0	16.8	16.3	20.2	..	0.5	10.7	1.7	28.0	5.8	100.0
Engine defects .. No.	11	5	5	3	7	5	36	7	5	3	..	1	7	1	..	3	27
A	7.7	5.5	6.4	5.0	3.5	14.3	5.9	6.5	6.8	2.9	..	11.1	10.9	9.1	..	11.1	4.6
B	30.6	13.9	13.9	8.3	19.4	13.9	100.0	25.9	18.6	11.1	..	3.7	25.9	3.7	..	11.1	100.0
Miscellaneous .. No.	35	24	36	26	51	11	187	30	13	30	..	1	6	1	40	4	125
A	24.6	26.4	46.1	43.3	25.5	31.4	30.6	27.8	17.6	28.6	..	11.1	9.4	9.1	20.3	14.8	21.0
B	18.7	12.8	19.3	13.9	27.3	5.9	100.0	24.0	10.4	24.0	..	0.8	4.8	0.8	32.0	3.2	100.0
Total number of mid-section derailments	No. 142	91	78	60	200	35	610	108	74	105	..	9	64	11	197	27	595
Per-centage.	23.3	14.9	12.8	9.8	32.8	5.7	100.0	18.2	12.4	17.6	..	1.5	10.8	1.9	33.1	4.5	100.0

A.—Percentage of the failure to the total on each Railway.

B.—Percentage of the failure on each Railway to the total on all Railways.

ANNEXURE XVI

**TOTAL NUMBER OF STATION AND MID-SECTION DERAILMENTS ACCORDING TO
MAIN CAUSES ON THE RAILWAYS DURING THE YEARS 1963-64 TO 1967-68 IN JUXTAPPOSITION
WITH CORRESPONDING FIGURES FOR 1957-58 TO 1962-63**

BROAD GAUGE

Main causes	1957-58 to 1962-63							1963-64 to 1967-68									
	Central ern	East- ern	North- ern	South- ern	South- East- ern	West- ern	All Rail- ways	Central	East- ern	North- ern	North- East- ern	South- East- ern	South- Central	South ern	West- ern	All Rail- ways	
Staff failures .. No.	475	229	327	179	315	101	1,638	242	53	163	1	17	170	19	193	51	909
A ..	48.7	39.6	54.1	38.6	43.9	40.4	45.1	50.7	25.5	46.7	100.0	40.5	44.9	40.4	36.3	38.6	42.0
B ..	29.2	14.1	20.1	10.9	19.3	6.2	100.0	26.6	5.8	18.0	0.1	1.9	18.7	2.2	21.2	5.6	100.0
Permanent way .. No.	80	102	51	78	122	33	466	44	38	36	..	11	100	8	135	27	389
A ..	8.2	17.7	8.5	16.3	16.9	13.2	12.9	9.2	18.3	10.3	..	26.2	26.4	17.0	25.4	20.5	18.4
B ..	17.2	21.9	10.9	16.7	20.2	7.1	100.0	11.0	9.5	9.0	..	2.8	25.1	2.0	33.8	6.8	100.0
Carriage & wagon defects .. No.	173	122	49	46	146	46	582	96	70	78	..	4	50	7	131	31	467
A ..	17.7	21.1	8.1	9.6	20.3	18.4	16.1	20.1	33.6	22.3	..	9.5	13.2	15.0	24.6	23.5	21.6
B ..	29.7	21.0	8.4	7.9	25.1	7.9	100.0	20.6	15.0	16.9	..	0.8	10.7	1.5	28.0	6.5	100.0
Engine defects .. No.	47	23	15	21	14	20	141	19	19	9	..	4	22	4	4	9	90
A ..	4.8	3.9	2.5	4.4	1.9	8.0	3.9	4.0	9.1	2.6	..	9.5	5.8	8.5	0.8	6.8	4.0
B ..	33.3	16.3	10.6	14.9	10.0	14.2	100.0	21.1	21.2	10.0	..	4.4	24.5	4.4	4.4	10.0	100.0
Miscellaneous .. No.	201	102	162	152	121	50	794	76	28	63	..	6	37	9	69	14	302
A ..	20.6	17.8	26.8	31.7	16.8	20.0	22.0	16.0	13.5	18.1	..	14.3	9.7	19.1	12.9	10.6	14.0
B ..	25.3	12.9	20.4	19.1	15.3	6.3	100.0	25.2	9.3	20.9	..	2.0	12.3	3.0	22.8	4.5	100.0
Total number of station & Mid-section derailments .. No.	976	578	604	476	718	250	3,611	477	208	349	1	42	379	47	532	132	2,167
Percentage ..	27.0	16.0	16.7	13.2	19.9	6.9	100.0	22.0	9.2	16.1	..	2.0	17.9	2.2	24.5	6.1	100.0

A—Percentage of the failure to the total on each Railway.

B—Percentage of the failure on each Railway to the total on all Railways.

ANNEXURE XVII

**DERAILMENTS AT STATIONS ON THE RAILWAYS—ACCORDING TO MAIN CAUSES ON THE
RAILWAYS DURING 1963-64 TO 1967-68 IN JUXTAPosition WITH COR
RESPONDING FIGURES FOR 1957-58 TO 1962-63**

METRE GAUGE

Main Causes		1957-58 to 1962-63							1963-64 to 1967-68									
		Central	North- ern	North- Eastern	North-east Frontier	South ern	Western	All Railways	Central	East- ern	North- ern	North- Eastern	North- east Frontier	South ern	South Central	South Eastern	West- ern	All Railways
Staff failures	No.	31	71	552	230	191	101	1,176	4	N	32	274	142	115	16	N	92	675
	A	59.6	32.7	50.5	45.1	41.7	43.7	45.9	28.6	O	36.4	51.2	37.6	39.7	39.0	O	46.7	43.8
	B	2.6	6.0	47.0	19.6	16.2	8.6	100.0	0.6		4.8	40.6	21.0	17.0	2.4		13.6	100.0
Permanent way failures	No.	1	23	164	70	62	38	358	..		11	49	70	51	4		16	201
	A	1.9	10.5	15.0	13.7	13.5	16.4	13.9	..	M	12.5	9.2	18.5	17.6	9.8	M	8.1	13.0
	B	0.3	6.4	45.8	19.6	17.3	10.6	100.0	..	E	5.4	24.4	34.8	25.4	2.0	E	8.0	100.0
Carriage & Wagon defects.	No.	6	49	141	53	36	30	315	3	T	27	69	51	48	11	T	36	245
	A	11.5	22.5	12.9	10.4	7.9	13.0	12.3	21.4	E	30.7	12.9	13.5	16.5	26.8	E	18.3	15.8
	B	1.9	15.6	44.8	16.8	11.4	9.5	100.0	1.2		11.0	28.2	20.8	19.6	4.5		14.7	100.0
Engine defects	No.	..	21	51	11	16	11	110	1	G	10	74	22	33	2	G	37	179
	A	..	9.6	4.6	2.2	3.5	4.8	4.3	7.1	A	11.3	13.8	5.8	11.4	4.9	A	15.8	11.6
	B	..	19.1	40.4	10.0	14.5	10.0	100.0	0.6	U	5.6	41.3	12.3	18.4	1.1	U	20.7	100.0
Miscellaneous	No.	14	54	185	146	153	51	603	6	Q	8	69	93	43	8	Q	16	243
	A	26.9	24.7	17.0	28.5	33.3	22.1	23.6	42.9	E	9.1	12.9	24.6	14.8	19.6	E	8.1	15.8
	B	2.3	8.9	30.7	24.2	25.4	8.5	100.0	2.5		3.3	28.4	38.2	17.7	3.3		6.6	100.0
Total number of derailments at stations	No.	52	218	1,093	510	458	231	2,562	14		88	535	378	290	41		197	1,543
	Per- cent- age	2.0	8.5	42.7	19.9	17.9	9.0	100.0	0.8		5.7	34.7	24.7	18.8	2.6		12.7	100.0

A—Percentage of the failure to the total on each railway.

B—Percentage of the failure on each Railway to the total on all Railways.

ANNEXURE XVIII

MID-SECTION DERAILMENTS ON THE RAILWAYS ACCORDING TO MAIN CAUSES DURING 1963-64 TO 1967-68 IN JUXTAPOSITION WITH CORRESPONDING FIGURES FOR 1957-58 TO 1962-63

METRE GAUGE

Main causes		1967-58 to 1962-63										1963-64 to 1967-68									
		Central	North- ern	North- Eastern	North- east Frontier	South- east	South- ern	West- ern	All Railways	Central	Eastern	North- ern	North- Eastern	North- east Frontier	South- ern	South Central	South Eastern	West- ern	All Railways		
Staff failures	No.	16	19	29	27	131	47	269	4		29	27	48	56	8		30	202			
	A	16.9	11.4	16.5	13.9	25.2	17.9	19.0	14.3	N	27.1	19.6	15.3	25.4	25.0	N	21.9	20.7			
Permanent way failures.	No.	5.9	7.1	10.8	10.0	48.7	17.5	100.0	1.9	O	14.4	13.4	23.8	27.7	3.9	O	14.9	100.0			
	B	6	17	27	22	56	23	151	2		18	14	73	41	6		8	162			
	No.	6.3	10.2	15.4	11.4	10.8	8.8	10.7	7.1		16.8	10.1	23.3	18.6	18.7		5.8	16.6			
	B	3.9	11.3	17.9	14.6	37.1	15.2	100.0	1.2	M	11.1	8.7	45.1	25.3	3.7	M	4.9	100.0			
Carriage & wagon defects	No.	44	70	44	65	130	107	460	10	E	37	47	76	75	5	E	66	316			
	A	46.3	41.9	25.0	33.5	25.1	45.8	32.6	35.7	R	34.6	34.1	24.3	34.1	15.6	R	48.2	32.4			
Engine defects	No.	9.6	15.2	9.6	14.1	28.3	23.2	100.0	3.1	E	11.7	14.9	24.1	23.7	1.6	E	20.9	100.0			
	B	1	6	13	9	10	12	54	1		2	10	16	15	2		3	49			
	No.	1.05	3.6	9.1	4.6	1.9	4.6	3.8	3.5		1.9	7.2	5.1	6.9	6.3		2.2	5.0			
	B	1.9	11.1	29.6	16.7	18.5	22.2	100.0	2.0		4.1	20.4	32.7	30.6	4.1		6.1	100.0			
Miscellaneous	No.	28	55	69	71	192	73	479	11	G	21	40	100	33	11	G	30	246			
	A	29.4	32.9	34.0	36.5	36.9	27.8	33.9	39.4	A	19.6	29.0	32.0	15.0	34.4	A	21.9	25.3			
	No.	5.9	11.5	12.5	14.8	40.1	15.2	100.0	4.5	U	8.5	16.3	40.7	13.4	4.4	U	12.2	100.0			
	B	95	187	176	194	519	262	1,413	28	G	107	138	313	220	32	G	137	975			
Total number of mid-section derailments	Per cent.	6.7	11.8	12.5	13.7	36.7	18.6	100.0	2.8	E	10.9	14.1	32.1	22.6	3.3	E	14.1	100.0			

A—Percentage of the failures to the total on each Railway.

B—Percentage of the failures on each Railway to the total on all Railways.

ANNEXURE XIX

TOTAL NUMBER OF STATION AND MID SECTION DERAILMENTS ON RAILWAYS ACCORDING TO MAIN CAUSES DURING 1963-64 TO 1967-68 IN JUXTAPOSITION WITH CORRESPONDING FIGURES FOR 1957-58 TO 1962-63

METRE GAUGE

Main causes	1957-58 to 1962-63										1963-64 to 1967-68					
	Central					North-east Frontier					North-east Frontier					
	North-eastern	North-eastern	South-eastern	Western	All Railways	Central	North-eastern	North-eastern	North-eastern	North-eastern	Central	North-eastern	North-eastern	South-eastern	Western	All Railways
Staff failures	..	No.	47	90	581	257	322	148	1,445	8	61	301	190	171	24	877
	A	31.9	23.4	45.8	36.5	32.9	32.9	30.0	36.4	19.0	31.2	44.7	27.5	33.5	33.0	34.8
	B	3.3	0.2	40.2	17.7	22.3	22.3	10.3	100.0	1.0	7.0	34.3	21.6	19.5	2.7	13.9
Permanent way failures	..	No.	7	40	191	92	118	61	509	2	29	63	143	92	10	363
	A	4.8	10.4	15.0	13.1	12.1	12.4	12.8	12.8	4.8	15.0	9.4	20.6	18.0	13.7	14.4
	B	1.4	7.9	37.5	18.1	23.2	11.9	100.0	0.6	8.0	17.3	39.4	23.3	2.8	6.6	100.0
Carriage & wagon defects	..	No.	50	119	185	118	166	137	775	13	64	116	127	123	16	561
	A	34.0	30.9	14.6	16.8	16.9	27.9	19.5	19.5	30.9	32.8	17.2	18.4	24.1	21.9	30.5
	B	6.4	15.3	24.0	15.2	21.4	17.7	100.0	2.3	11.4	20.7	22.7	21.9	2.9	18.1	100.0
Engine defects	..	No.	1	27	67	20	26	23	164	2	12	84	38	48	4	228
	A	0.7	7.0	5.3	2.8	2.7	4.6	4.1	4.1	4.8	6.1	12.5	5.5	9.4	5.4	12.0
	B	0.6	16.4	41.0	12.2	15.8	14.0	100.0	0.9	5.2	36.8	16.7	21.1	1.8	17.5	100.0
Miscellaneous	..	No.	42	109	245	217	345	124	1,082	17	29	109	193	78	19	489
	A	28.5	28.2	19.2	30.7	35.3	16.1	27.2	27.2	40.5	14.9	16.2	28.0	15.0	26.0	13.8
	B	3.9	10.1	22.6	20.0	31.9	11.5	100.0	3.5	5.9	22.3	39.5	15.5	3.9	9.4	100.0
Total number of station & mid-section derailments.	No.	147	385	1,269	704	977	493	3,975	42	195	673	691	510	73	334	2,518
Percent- age.	3.7	9.7	31.9	17.7	24.6	12.4	100.0	1.7	7.8	26.7	27.4	20.3	2.9	13.2	100.0	

A—Percentage of failures to the total on each Railway.

B—Percentage of failures on each Railway to the total on All Railways.

[illegible]

INCIDENCE OF DERAILMENTS DUE TO CARRIAGE AND WAGON DEFECTS CORRELATED TO VEHICLE KILOMETRES ON METRE GAUGE

[illegible]

ANNEXURE XXII

INCIDENCE OF DERAILMENTS DUE TO ENGINE DEFECTS COR-
RELATED TO TRAIN KILOMETRES ON BROAD GAUGE

Railway					1957-58 to 1962-63	1963-64 to 1967-68
					Incidence per million train kilometres	Incidence per million train kilometres
Central .. .. .	..	..	..	..	0.120	0.063
Eastern .. .. .	..	..	..	..	0.077	0.069
Northern .. .. .	..	..	..	..	0.046	0.031
North Eastern .. .. .	..	..	..	..	..	..
Northeast Frontier .. .. .	..	..	..	..	..	0.363
Southern .. .. .	..	..	..	..	0.134	0.164
South Central .. .. .	..	..	..	..	..	0.111
South Eastern .. .. .	..	..	..	..	0.067	0.018
Western .. .. .	..	..	..	..	0.116	0.055
Average .. .. .	..	..	..	..	0.146	0.063

ANNEXURE XXIII

INCIDENCE OF DERAILMENTS DUE TO ENGINE DEFECTS COR-
RELATED TO TRAIN KILOMETRES ON METRE GAUGE

Railway					1957-58 to 1962-63	1963-64 to 1967-68
					Incidence per million train kilometres	Incidence per million train kilometres
Central .. .. .	..	..	..	..	0.030	0.063
Northern .. .. .	..	..	..	..	0.405	0.181
North Eastern .. .. .	..	..	..	..	0.400	0.591
Northeast Frontier .. .. .	..	..	..	..	0.273	0.487
Southern .. .. .	..	..	..	..	0.107	0.246
South Central .. .. .	..	..	..	..	..	0.147
Western .. .. .	..	..	..	..	0.132	0.248
Average .. .. .	..	..	..	..	0.206	0.330

ANNEXURE XXIV

MAIN CAUSES OF PASSENGER AND GOODS TRAIN DERAIL-
MENTS

Causes	Broad Gauge				Metre Gauge			
	Passenger Trains		Goods Trains		Passenger Trains		Goods Trains	
	No.	%	No.	%	No.	%	No.	%
1. Staff failures	85	25.9	824	44.8	72	20.4	805	36.7
2. Permanent way failures	48	14.6	351	19.1	50	14.2	313	14.5
3. Carriage & Wagon defects	64	19.4	403	21.9	68	19.7	493	22.9
4. Engine defects	51	15.5	39	2.2	58	16.5	170	7.9
5. Miscellaneous	81	24.6	221	12.0	101	29.2	388	18.0
6. Total	329	100.0	1,838	100.0	349	100.0	2,169	100.0

ANNEXURE XXV
STAFF FAILURES—CLASSIFIED

Causes	Broad gauge		Metre gauge		Total	
	No.	%	No.	%	No.	%
(i) Incorrect setting; non-locking or mis-manipulation of points or bursting of points	894	43.3	303	34.5	697	39.0
(ii) Defective or uneven loading ..	71	7.8	99	11.3	170	9.5
(iii) Starting or stopping a train with jerk or sudden application of brakes	38	4.2	117	13.3	155	8.7
(iv) Rough shunting; bumping or disregard of signals in shunting ..	81	8.9	89	10.1	170	9.5
(v) Disregard of approach or departure signals	123	13.5	63	7.2	186	10.4
(vi) Excessive speed	57	6.3	121 44.4	13.8	178 50.2	10.0
(vii) Failure to regulate running of trains or failures to control trains ..	104	11.5	51	5.8	155	8.7
(viii) Empty wagon between loaded wagons or mis-marshalling ..	11	1.2	19	2.2	30	1.7
(ix) Non-protection of engineering works or failure to issue caution orders	14	1.5	8	0.9	22	1.2
(x) Incorrect setting or non-locking of points at outlying sidings during shunting	16	1.8	7	0.9	23	1.3
(xi) Total	909	100.0	877	100.0	1,786	100.0

ANNEXURE XXVI

STAFF FAILURES RESULTING IN DERAILMENTS DURING 1963-64 TO 1967-68 CLASSIFIED UNDER PRIMARY CAUSES

Classification of staff failures	Broad gauge										Metre gauge									
	CR	ER	NR	NFR	NFR	SR	SCR	SER	WR	Total	CR	NR	NFR	NFR	SR	SCR	WR	Total		
1. Incorrect setting or non-locking or misalignment of points; incorrect setting of Trap points, Bursting of points	No.	113	22	66	..	9	79	6	78	21	394	2	18	119	64	48	6	46	303	
2. Defective loading viz. uneven or overloading, shifting of loads etc.	No.	17	9	6	..	1	15	..	20	3	71	..	7	19	36	26	6	5	99	
3. Starting or stopping a train with jerk/or sudden application of brakes	No.	7	2	9	..	1.4	21.1	..	28.2	4.2	100.0	..	7.1	19.1	30.3	26.2	6.1	5.1	11.3	
4. Rough shunting; Bumping or disregard of shunting signals	No.	2	9	..	..	..	5.0	5.3	4.2	3.9	4.2	25.0	9.8	13.6	12.6	14.0	16.6	13.1	13.3
5. Disregard of Approach or departure signals by drivers	No.	21	12	19	..	1	28	6	30	6	123	..	1	34	6	18	2	2	63	
6. Excessive speed	No.	16	2	4	..	2	10	1	19	3	57	2	21	25	21	23	1	28	121	
7. Failing to regulate the running trains; failure to control trains resulting in overshooting	No.	40	3	25	1	2	7	3	12	11	104	..	..	19	8	11	1	12	51
8. Empty wagon between loaded wagons or mis-marshalling	No.	7	1	..	..	..	..	..	..	..	..	..	..	6.3	4.2	6.4	4.2	9.8	5.8
9. Non-protection of engineering works; failure to issue caution orders for Engineering works or inadequate protection at site	No.	1	2	4	..	..	2	..	..	..	..	..	..	37.2	15.7	21.6	2.0	23.5	100.0
10. Incorrect setting or non-locking of points at outlying sidings during shunting etc.	No.	7	2	14.3	28.5	..	14.3	..	28.5	7.2	100.0	..	..	25.0	62.5	..	..	13.5	100.0
11. Total	No.	242	53	163	1	17	170	19	193	51	909	8	61	301	190	171	24	122	877	
Percentage	No.	26.6	5.8	18.0	0.1	1.9	18.7	2.1	21.2	5.6	100.0	1.0	7.0	34.3	21.6	19.5	2.7	13.9	100.0	

'A'—denotes percentage of the failure to the total on each Railway.

'B'—denotes percentage of the failure on each Railway to the total on all Railways.

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ANNEXURE XXVII
TRACK DEFECTS—CLASSIFIED

Causes	Broad gauge		Metre gauge		Total	
	No.	%	No.	%	No.	%
1. Defective points; crossings and turnouts	15	3.8	7	1.9	22	2.9
2. Defective cross or longitudinal levels	56	14.0	35	9.6	91	11.9
3. Badly aligned curve or incorrect super-elevation or kinks-in track ..	26	6.5	10	2.8	36	4.7
4. Incorrect gauge	54	13.5	47	12.0	101	13.3
Sinkage of track	124	31.1	80	22.0	204	26.8
6. Defective track material ..	13	3.3	16	4.4	29	3.8
7. Other track defects	58	14.5	88	24.3	146	19.2
8 Combined effect of defects in track and rolling stock but the track defect was pre-dominating factor ..	53	13.3	80	22.0	133	17.4
9. Total	399	100.0	363	100.0	762	100.0

ANNEXURE XXVIII

TRACK DEFECTS RESULTING IN DERAILMENTS DURING 1963-64 TO 1967-68 CLASSIFIED UNDER PRIMARY CAUSES

Nature of Track defects	Broad gauge										Metre gauge							
	CR	ER	NR	NFR	SR	SCR	SER	WR	Total	CR	NR	NFR	SR	SCR	WR	Total		
1. Defective points or crossings or Turnouts ..	No. 3	1	2	..	7	1	..	1	15	..	2	3	..	1	..	1	7	
A	6-8	2-7	5-6	..	7-0	12-5	..	3-7	3-8	..	6-9	4-8	..	1-1	..	4-1	1-9	
B	20-2	6-7	13-3	..	46-6	6-6	..	6-6	100-0	..	28-6	42-8	..	14-3	..	14-3	100-0	
2. Defective cross or longitudinal levels ..	No. 6	10	3	..	11	2	20	4	56	..	4	2	2	26	1	..	35	
A	13-6	26-3	8-3	..	11-0	25-0	14-8	14-9	14-0	..	13-8	3-2	1-4	28-3	10-0	..	9-6	
B	10-7	18-0	5-3	..	19-7	3-5	35-7	7-1	100-0	..	11-5	5-8	5-8	74-0	2-9	..	100-0	
3. Badly aligned curve or incorrect super-elevation or kinks in track ..	No. 1	4	2	..	7	1	8	3	26	..	..	1	4	4	..	1	10	
A	2-3	10-5	5-6	..	7-0	12-5	5-0	11-1	6-5	..	7-0	1-6	2-8	4-3	..	4-1	2-8	
B	3-8	15-4	7-7	..	26-9	3-8	30-8	11-6	100-0	..	..	10-0	40-0	40-0	..	10-0	100-0	
4. Incorrect gauge ..	No. 4	9	6	..	2	18	1	13	1	54	..	1	12	19	14	..	1	47
A	9-1	23-7	16-7	..	18-2	18-0	12-5	9-6	3-7	13-5	..	3-5	19-0	13-3	15-2	..	4-2	13-0
B	7-4	16-6	11-1	..	3-7	33-3	1-9	24-1	1-9	100-0	..	2-1	25-5	40-4	29-9	..	2-1	100-0
5. Sinkage of track ..	No. 11	7	5	..	2	21	2	70	6	124	1	3	16	29	19	5	7	80
A	25-0	18-4	13-8	..	18-2	21-0	25-0	51-9	22-2	31-1	50-0	10-3	25-4	20-3	20-7	50-0	29-2	22-0
B	8-8	5-7	4-0	..	1-6	17-0	1-6	56-5	4-8	100-0	1-3	3-7	20-0	36-3	23-7	6-3	8-7	100-0
6. Defective track material ..	No. 9	4	2	..	3	3	..	1	..	13	..	1	10	1	4	..	..	16
A	9-1	..	5-6	..	27-3	3-0	..	0-8	..	3-3	..	3-5	15-9	0-7	4-3	..	..	4-4
B	30-7	..	15-4	..	23-1	23-1	..	7-7	..	100-0	..	6-2	62-6	6-2	25-0	..	..	100-0
7. Other Track Defects ..	No. 13	1	9	..	4	13	1	11	6	58	..	7	11	50	9	1	10	88
A	29-5	2-6	25-0	..	36-3	13-0	12-5	8-1	22-2	14-5	..	24-1	17-4	34-9	9-8	10-0	41-7	24-3
B	23-4	1-7	15-6	..	6-9	22-4	1-7	19-0	10-4	100-0	..	7-9	12-5	56-8	10-2	1-2	11-4	100-0
8. Combined effect of defects in track and Rolling Stock etc. ..	No. 2	6	7	..	..	20	..	12	6	53	1	11	8	38	15	3	4	80
A	4-6	15-8	19-4	..	..	20-0	..	8-9	22-2	13-3	50-0	37-9	12-7	28-6	16-3	30-0	18-7	22-0
B	3-8	11-3	13-2	..	..	37-7	..	22-7	11-3	100-0	1-3	13-7	10-0	47-5	18-8	3-7	6-0	100-0
9. Total ..	No. 44	38	36	..	11	100	8	135	27	399	2	29	63	143	82	10	24	363
Percentage ..	11-0	9-5	9-0	..	2-8	25-1	2-0	33-9	6-7	100-0	0-6	8-0	17-3	39-4	25-3	2-8	6-6	100-0

A—Percentage of the defect to the total on each Railway.

B—Percentage of the defect on each Railway to the total on all railways.

ANNEXURE XXIX

COMPARATIVE INCIDENCE OF DERAILMENTS CAUSED BY SINKAGE OF TRACK OR BY OTHER TRACK DEFECTS

Railway	Sinkage of track		Defective track material and other track defects	
	1957-58 to 1962-63	1963-64 to 1967-68	1957-58 to 1962-63	1963-64 to 1967-68
Eastern	25	7	39	1
North Eastern	53	16	94	21
Southern	17	40	33	30
South Eastern	32	70	16	12

ANNEXURE XXX

CARRIAGE AND WAGON DEFECTS—CLASSIFIED

Causes	Broad gauge		Metre gauge		Total	
	No.	%	No.	%	No.	%
1. Defective or broken springs or suspensions	81	17.35	170	30.3	251	24.4
2. Defective or broken axle boxes	35	7.49	37	6.6	72	7.0
3. Defective Buffers	12	2.57	17	3.0	29	2.8
4. Binding brake blocks	34	7.28	22	3.9	56	5.4
5. Defective bogie holster hangers	13	2.78	12	2.2	25	2.4
6. Broken axle or journal	65	13.92	56	10.0	121	11.8
7. Defective wheel or tyre	54	11.56	38	6.8	92	9.0
8. Coupling failures	14	3.00	8	1.4	22	2.1
9. Defective, inadequate or excessive play in brasses	10	2.14	50	8.9	60	5.8
10. Breakage of undergear vacuum and brake fittings	65	13.92	57	10.2	122	11.9
11. Hot Axles	35	7.49	8	1.4	43	4.2
12. Defective brake power	8	1.72	5	0.9	13	1.3
13. Combined effect of rolling stock and track defects with carriage and wagon defects being the predominant factor	41	8.78	81	14.4	122	11.9
14. Total	467	100.0	561	100.0	1028	100.0

ANNEXURE XXXI

CARRIAGE AND WAGON DEFECTS CAUSING DERAILMENTS DURING 1963-64 TO 1967-68 CLASSIFIED
UNDER PRIMARY CAUSES

Causes	Broad gauge										Metre gauge								
	C	E	N	NE	NF	S	SC	SE	W	Total	C	N	NE	NF	S	SC	W	Total	
1. Defective or breakage of spring or suspension	No.	19	11	16	..	..	7	1	23	4	81	8	20	29	34	49	7	23	170
A		19-8	15-7	20-5	..	..	14-0	14-3	17-6	13-0	17-35	61-5	31-2	25-0	26-8	39-8	43-8	22-5	30-3
B		23-4	13-6	19-8	..	..	8-6	1-2	28-5	4-9	100-0	4-7	11-8	17-1	20-0	28-8	4-1	13-5	100-0
2. Defective or breakage of axle box	.. No.	8	5	1	..	1	4	..	15	1	35	1	3	15	8	5	2	3	37
A		8-3	7-1	1-3	..	25-0	8-0	..	11-4	3-2	7-49	7-7	4-7	12-9	6-3	4-1	12-5	2-9	6-6
B		22-9	14-3	2-8	..	2-8	11-4	..	43-0	2-8	100-0	2-7	8-1	40-5	21-7	13-5	5-4	8-1	100-0
3. Defective buffers	.. No.	4	1	..	..	1	1	..	4	1	12	1	1	2	12	..	..	1	17
A		4-2	1-4	..	..	25-0	2-0	..	3-1	3-2	2-57	7-7	1-6	1-7	9-4	..	..	1-0	3-0
B		33-4	8-3	..	..	8-3	8-3	..	33-4	8-3	100-0	5-9	5-9	11-7	70-6	..	..	5-9	100-0
4. Defective brakes or binding brake blocks	No.	2	6	7	..	1	..	..	16	2	34	..	1	4	12	5	..	..	22
A		2-1	8-6	9-0	..	25-0	..	..	12-2	6-5	7-28	..	1-6	3-5	9-4	4-1	..	3-9	..
B		6-0	17-4	20-6	..	3-0	..	..	47-0	6-0	100-0	..	4-5	18-2	54-6	22-7	..	..	100-0
5. Defective bogie bolster hangers	.. No.	2	..	3	..	..	4	..	4	..	13	1	..	7	1	2	..	1	12
A		2-1	..	3-8	..	..	8-0	..	3-1	..	2-78	7-7	..	6-0	0-8	1-6	..	1-0	2-2
B		15-4	..	23-2	..	..	30-7	..	30-7	..	100-0	8-3	..	58-4	8-3	16-7	..	8-3	100-0
6. Broken axle or journal	.. No.	12	9	15	..	..	9	2	13	5	65	..	13	9	8	9	1	16	56
A		12-5	12-9	19-2	..	..	18-0	28-5	9-9	16-1	13-92	..	20-3	7-8	6-3	7-3	6-2	15-7	10-0
B		18-5	13-8	23-1	..	..	13-8	3-1	20-0	7-7	100-0	..	23-2	16-1	14-3	16-1	1-8	28-5	100-0
7. Defective wheel or tyre	.. No.	16	4	10	..	..	6	..	14	2	54	..	7	5	7	9	..	10	38
A		18-7	5-7	12-8	..	..	12-0	..	10-7	6-4	11-56	..	10-9	4-3	5-5	7-3	..	9-8	6-8
B		33-3	7-4	18-5	..	..	11-1	..	26-0	3-7	100-0	..	18-4	13-2	18-4	23-7	..	26-3	100-0

APPENDIX—contd.

CARRIAGE AND WAGON DEFECTS CAUSING DERAILMENTS DURING 1963-64 TO 1967-68 CLASSIFIED UNDER PRIMARY CAUSES—contd.

Causes	Broad gauge										Metro gauge									
	C	E	N	NE	NF	S	SO	SE	W	Total	C	N	NE	NF	S	SO	W	Total		
8. Coupling failures	No. 3	..	1	..	..	2	..	7	1	14	..	..	..	3	2	..	3	8
A	3-1	..	1-3	..	..	4-0	..	5-3	3-2	3-00	..	..	..	2-4	1-6	..	2-9	1-4
B	21-4	..	7-2	..	..	14-3	..	50-0	7-1	100-0	..	..	..	37-5	25-0	..	37-5	100-0
9. Defective, inadequate or excessive play in Brakes.	No. 1	2	2	..	..	2	..	3	..	10	..	9	2	14	3	..	22	50
A	1-0	2-9	2-6	..	..	4-0	..	2-3	..	2-14	..	14-1	1-7	11-0	2-5	..	21-6	8-9
B	10-0	20-0	20-0	..	..	20-0	..	30-0	..	100-0	..	18-0	4-0	28-0	6-0	..	44-0	100-0
10. Breakage of undergear and vacuum or brake fittings.	No. 14	9	8	..	..	6	2	19	7	65	..	2	27	2	10	1	15	57
A	14-6	12-9	10-3	..	..	12-0	28-6	14-5	22-6	13-92	..	3-1	23-3	1-0	8-1	6-3	14-7	10-2
B	21-5	13-9	12-3	..	..	9-2	3-1	29-2	10-8	100-0	..	3-5	47-4	3-5	17-5	1-8	26-3	100-0
11. Hot axles	No. 4	12	9	..	..	1	1	3	5	35	..	..	3	..	4	1	..	8
A	4-2	17-1	11-5	..	..	2-0	14-3	2-3	16-1	7-49	..	..	2-6	..	3-3	6-2	..	1-4
B	11-4	34-3	25-7	..	..	2-9	2-9	8-5	14-3	100-0	..	..	37-5	..	50-0	12-5	..	100-0
12. Defective brake power of train	No. 5	1	..	..	..	..	..	2	..	8	..	..	1	3	..	..	1	5
A	5-2	1-4	..	..	..	..	..	1-5	..	1-72	..	..	0-9	2-4	..	..	1-0	0-9
B	62-5	12-5	..	..	..	..	..	25-0	..	100-0	..	..	20-0	60-0	..	..	20-0	100-0
13. Combined effects of defects in Rolling Stock and defects in track or excessive speed but predominant cause being defect in Rolling Stock and other being secondary causes.	No. 4	10	6	..	1	8	1	8	3	41	2	8	12	23	25	4	7	81		
A	4-2	14-3	7-7	..	25-0	16-0	14-3	6-1	9-7	8-78	15-4	12-5	10-3	18-1	20-3	25-0	6-9	14-4		
B	9-8	24-4	14-7	..	2-4	19-5	2-4	19-5	7-3	100-0	2-5	9-9	14-7	28-4	30-9	5-0	8-6	100-0		
Total	No. 96	70	78	..	4	50	7	131	31	467	13	64	116	127	123	16	102	561		
percentage	20-6	15-0	16-7	..	0-8	10-7	1-5	28-1	6-6	100-0	2-3	11-4	20-7	22-7	21-9	2-9	18-1	100-0		

A—Percentage of the defects to the total on each Railway.

B—Percentage of the defects on each Railway to the total on all Railways.

ANNEXURE XXXII
ENGINE DEFECTS—CLASSIFIED

Causes	Broad gauge		Metre gauge		Total	
	No.	%	No.	%	No.	%
1. Defective or broken springs or suspension	8	8.9	20	8.8	28	8.8
2. Defective or broken axle boxes ..	4	4.4	7	3.1	11	3.5
3. Defective Wheels or tyres ..	25	27.8	41	17.9	66	20.7
4. Breakage of axle or journal ..	17	18.9	14	6.2	31	9.7
5. Breakage of undergear or brake fittings	13	14.5	14	6.2	27	8.5
6. Defective brake power ..	3	3.3	1	0.4	4	1.3
7. Other engine defects	12	13.3	97	42.5	109	34.3
8. Combined effect of defects in engine and track but engine defect being the predominant factor ..	8	8.9	34	14.9	42	13.2
9. Total ..	90	100.0	228	100.0	318	100.0

ANNEXURE XXXIII

ENGINE DEFECTS CAUSING DERAILMENTS DURING 1963-64 TO 1967-68 CLASSIFIED UNDER PRIMARY CAUSES

Nature of Causes	Broad Gauge										Metre Gauge									
	C	E	N	NF	S	SC	SE	W	Total	C	N	NE	NF	S	SC	W	Total			
1. Defective or breakage of Spring or suspension	No. A 5-26 21-05 11-11	4	1	..	..	1	..	..	1 8	..	..	6	7	4	1	2	20
	B 12-5 60-0 12-5	..	..	..	4-6	..	..	..	11-1 8-9	..	..	7-1 19-3	8-3 25-0	..	..	5-0 8-7	..
2. Defective/breakage of axle Box	No. A .. 5-26 1	..	..	..	12-5	..	..	..	12-5 100-0	..	..	30-0 35-0	20-0 5-0	..	..	10-0 100-0	..
	B .. 25-0	..	..	..	2	..	..	1	.. 4	..	..	4	..	2	..	1	7
3. Defective wheel or tyre..	No. A 4 1 5	..	..	..	9-0	..	..	..	4-4	..	..	4-8	4-2	..	..	2-5 3-4	..
	B 21-05 5-26 55-56	..	..	..	50-0	..	..	..	100-0	..	..	57-1	28-6	..	..	14-3 100-0	..
4. Breakage of axle or journal	No. A 21-05 5-26 55-56	..	..	..	27-3	..	..	..	4-5 27-8	..	..	6-4	2	5	..	24-4	..
	B 16-0 4-0 20-0	..	..	..	4-0 24-0	..	..	..	50-0 44-5	..	..	5-1 10-4	10-2	..	..	60-0 17-9	..
5. Breakage of undergear or brake fittings	No. A 26-32 21-05 22-22	..	..	..	8-0	..	..	..	16-0 100-0	..	..	12-1 10-0	4-8 12-2	..	..	58-5 100-0	..
	B 29-4 23-5 11-8	..	..	..	3	..	..	..	2 17	..	..	2-4	2	5	..	2 14	..
6. Defective brake power..	No. A 26-32 21-05 22-22	..	..	..	25-0 13-7	..	..	..	22-2 18-9	..	..	33-3 2-4	..	..	..	5-0 6-2	..
	B 29-4 23-5 11-8	..	..	..	5-9 17-6	..	..	..	11-8 100-0	..	..	28-6 14-3	..	..	..	14-3 100-0	..
7. Other Engine defects ..	No. A 15-79 21-05	..	..	..	13-7 25-0	..	..	..	2 13	..	..	5	1	4	..	4 14	..
	B 23-1 30-8	..	..	..	23-1 7-6	..	..	..	22-2 14-5	..	..	5-9 2-3	8-3	..	..	10-5 6-2	..
8. Combined effect of defects in engine and track but engine defect being the predominant factor	No. A 10-53	..	..	..	..	..	..	..	15-4 100-0	..	..	35-7 7-1	28-6	..	..	28-6 100-0	..
	B 66-7	..	..	..	..	..	..	..	.. 3	..	..	1	..	..	..	.. 0-4	..
	No. A 15-79 26-33	..	..	..	1-2 1	..	..	..	100-0	..	..	100-0	18 15	..	..	6 97	..
	B 25-0 41-7	..	..	..	25-0 9-0	..	..	..	12	..	..	16-7 66-7	47-2 31-2	..	..	15-0 42-5	..
	No. A 5-26	..	..	..	8-3 16-7	..	..	..	13-3	..	..	57-7 18-5	15-5	..	..	6-2 100-0	..
	B 12-5	..	..	..	1 5	..	..	..	100-0	..	..	2-1 6	10 13	..	..	3 1 34	..
	No. A 5-26	..	..	..	25-0 22-7	..	..	..	8	..	..	8-3 7-1	26-2 27-2	..	..	2-5 14-7	..
	B 12-5	..	..	..	12-5 62-5	..	..	..	8-9	..	..	2-9 17-7	29-4 38-3	..	..	2-9 100-0	..
	No. 19 19 9	4	22	4	4	4	4	9	90	2	12	84	38	48	4	40	228			
Total	Per- 21-1 21-1 10-0	4-4	24-5	4-5	4-4	4-4	4-4	10-0	100-0	0-9	5-3	37-0	16-6	21-2	1-5	17-5	100-0			
	cent																			

A—Percentage of the defects to the total on each Railway.

B—Percentage of the defects on each Railway to the total on All Railways.

ANNEXURE XXXIV

MISCELLANEOUS CAUSES—ITEMISED

Causes	Broad gauge		Metre gauge		Total	
	No.	%	No.	%	No.	%
1. Obstruction of track	116	38·4	184	37·6	300	37·9
2. Obstruction caused by road vehicles	5	1·7	6	1·3	11	1·5
3. Cattle run over	30	9·9	57	11·6	87	11·0
4. Tampering with track ..	24	7·9	21	4·2	45	5·7
5. Causes not determined	38	12·6	49	10·0	87	11·0
6. Other causes	81	26·8	157	32·2	238	30·0
7. Cases not finalised	8	2·7	15	3·1	23	2·9
8. Total	302	100·0	489	100·0	791	100·0

ANNEXURE XXXV

MISCELLANEOUS CAUSES RESULTING IN DERAILMENTS DURING 1963-64 TO 1967-68
CLASSIFIED UNDER PRIMARY CAUSES

Nature of causes	Broad Gauge										Metro Gauge									
	C	E	N	NF	S	SC	SE	W	Total	C	N	NE	NF	S	SC	W	Total			
1. Obstruction on Track	No.	27	11	19	3	17	3	30	6	116	5	14	65	42	36	5	17	184		
	A	35.6	39.2	30.5	50.0	45.9	33.0	43.5	42.8	38.4	29.5	48.2	59.7	21.8	47.4	26.32	36.9	37.6		
	B	23.3	9.4	16.4	2.6	14.6	2.6	25.9	5.2	100.0	2.7	7.6	35.3	22.8	19.6	2.7	9.3	100.0		
2. Obstruction caused by Road vehicles	No.			2				3		5			2	1	3			6		
	A			3.2				4.4		1.7			1.8	0.5	3.9			1.3		
	B			40.0				60.0		100.0			33.4	10.6	50.0			100.0		
3. Cattle run over	No.	2	7	12		2		4	3	30	1	9	12	13	3	4	15	57		
	A	2.6	25.0	19.0		5.4		5.8	21.4	9.9	5.8	31.4	11.1	6.7	3.9	21.05	32.6	11.6		
	B	6.7	23.3	40.0		6.7		13.3	10.0	100.0	1.8	15.8	21.0	22.8	3.3	7.0	20.3	100.0		
4. Tampering with track	No.	2				1		19	2	24			4	10	4	1	2	21		
	A	2.6				2.8		27.5	14.4	7.9			3.8	5.2	3.3	5.28	4.3	4.2		
	B	8.3				4.2		79.2	8.3	100.0			19.0	47.6	19.0	4.8	9.6	100.0		
5. Cause not determined	No.	19		2		3		10	3	38	8	3	13	10	6	1	8	49		
	A	25.0		3.2		8.1		11.5	14.5	21.4	12.6	47.1	10.2	11.8	5.2	7.9	5.26	17.5		
	B	50.0		5.3		8.0		2.7	28.0	8.0	100.0	16.3	6.1	26.5	20.4	12.3	2.0	16.3		
6. Other causes	No.	26	10	28	3	11	1	2		81	2	3	13	114	23	2		157		
	A	34.2	35.8	44.1	50.0	29.7	11.5	2.9		26.8	11.8	10.2	11.8	59.0	30.3	10.53		32.2		
	B	32.1	12.3	34.6	3.7	13.6	1.2	2.5		100.0	1.3	1.9	8.2	72.6	14.7	1.3		100.0		
7. Cases not finalised	No.					3		4		8				3	1	6		15		
	A					8.1		44.0	1.4		2.7	5.8		1.6	1.3	31.58	8.7	3.1		
	B					37.5		50.0	12.5		100.0	6.7		29.0	6.7	40.0	26.6	100.0		
Total	No.	76	28	63	6	37	9	69	14	302	17	29	109	193	76	19	46	489		
	per-	25.2	9.3	20.9	2.0	12.2	3.0	22.8	4.6	100.0	3.5	5.9	22.3	39.5	15.5	3.9	9.4	100.0		
	cent.																			

A—Percentage of cause to the total on each Railway.

B—Percentage of cause on each Railway to the total on all Railways.

ANNEXURE XXXVI

INCIDENCE OF DERAILMENTS ACCORDING TO SPEED FACTOR

Particulars of trains		Number of derailments	Percent- age
Broad Gauge			
A. Passenger trains			
(i) Trains with a booked speed of 50 k.m.p.h. or less	..	83	27.3
(ii) Trains with a booked speed of over 50 k.m.p.h. and upto 75 k.m.p.h.	.. .. .	155	51.2
(iii) Trains with a booked speed of over 75 k.m.p.h.	..	65	21.5
Total	..	303	
B. Goods trains			
(i) Trains with a booked speed of 50 k.m.p.h. or less	.. ..	1105	62.4
(ii) Trains with a booked speed of over 50 k.m.p.h. and upto 75 k.m.p.h.	.. .. .	666	37.6
Total	..	1771	
Metre Gauge			
C. Passenger trains			
(i) Trains with a booked speed of 50 k.m.p.h. or less	..	213	82.6
(ii) Trains with a booked speed of over 50 k.m.p.h. and upto 75 k.m.p.h.	.. .. .	127	37.4
Total	..	340	
D. Goods trains			
(i) Trains with a booked speed of 40 k.m.p.h. or less	.. ..	1783	83.7
(ii) Trains with a booked speed of over 40 k.m.p.h. and upto 50 k.m.p.h.	.. .. .	348	16.3
(iii) Trains with a booked speed of over 50 k.m.p.h.	..	3	0.1
Total	..	2134	

ANNEXURE XXXVII

THE NUMBER OF ACCIDENTS PER MANNED AND UNMANNED LEVEL CROSSINGS ON THE DIFFERENT RAILWAYS

Particulars	Central		Eastern		Northern		North Eastern		Northeast Frontier		Southern		South Central		South Eastern		Western		Total	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Number of Manned level crossings.	1,885	1,805	1,154	1,503	2,373	2,959	1,405	2,480	476	698	2,322	2,536	..	1,048	724	773	2,419	2,628	12,757	16,300
Number of accidents at manned level crossings.	29	5	37	35	47	41	66	27	29	22	38	18	..	7	25	14	27	33	298	202
Number of accidents per manned level crossings.	.02	.002	.03	.027	.02	.014	.05	.011	.06	.031	.02	.007	..	.006	.03	.02	.01	.01	.02	.012
Number of unmanned level crossings.	1,843	1,894	968	1,118	4,950	4,599	2,519	1,442	1,251	1,517	5,193	5,029	..	2,149	3,131	3,354	4,958	4,983	24,831	26,085
Number of accidents at unmanned level crossings.	55	21	48	33	108	57	82	54	81	51	115	100	..	12	51	51	89	62	629	4416
Number of accidents per unmanned level crossings.	.03	.01	.05	.029	.02	.012	.03	.037	.06	.033	.02	.02	..	.005	.02	.015	.02	.02	.03	.016
Total number of manned and unmanned level crossings.	3,728	3,799	2,142	2,421	7,322	7,558	3,924	3,922	1,727	2,215	7,515	7,565	..	3,197	3,865	4,127	7,376	7,611	37,588	42,385
Total number of accidents at manned and unmanned level crossings.	84	26	85	68	155	98	148	81	110	73	153	118	..	19	76	65	116	95	927	643
Number of accidents per manned and unmanned level crossings.	.02	.006	.04	.028	.02	.013	.04	.021	.06	.032	.02	.015	..	.005	.02	.016	.02	.012	.03	.015

NOTE (i) A denotes 1957-58 to 1962-63 and B denotes 1963-64 to 1967-68.

(ii) The number of manned and unmanned level crossings has been taken to be the average for five years for each railway.

ANNEXURE XXXVIII
INCIDENCE OF LEVEL CROSSING ACCIDENTS—PASSENGER AND GOODS TRAINS—GAUGE-WISE

Year	Passenger Trains						Goods Trains					
	Broad Gauge			Metre Gauge			Broad Gauge			Metre Gauge		
	Manned	Un-manned	Total	Manned	Un-manned	Total	Manned	Un-manned	Total	Manned	Un-manned	Total
1963-64	15	22	37	12	37	49	14	18	32	15	15	30
1964-65	1	30	31	17	22	39	8	23	31	12	15	27
1965-66	13	14	27	8	25	33	16	16	32	11	15	26
1966-67	9	25	34	1	23	24	10	17	27	7	4	11
1967-68	14	23	37	5	22	27	10	14	24	4	12	16
Total	52	114	166	43	129	172	58	88	146	49	61	110

ANNEXURE XXXIX

INCIDENCE OF LEVEL CROSSING ACCIDENTS CORRELATED TO
TRAIN KILOMETRES

Year	Broad Gauge		Metre Gauge		Total	
	Number	Rate per million train kilometres	Number	Rate per million train kilometres	Number	Rate per million train kilometres
1957-58	78	·32	35	·47	..	..
1958-59	61	·25	74	·61	..	..
1959-60	61	·24	57	·45	..	..
1960-61	78	·30	81	·63	..	..
1961-62	65	·24	79	·61	..	..
1962-63	74	·27	81	·62	..	..
Average for six years	69	·27	71	·57	..	..
1963-64	69	·25	79	·59	148	·36
1964-65	62	·22	66	·48	128	·31
1965-66	59	·205	59	·419	118	·27
1966-67	61	·209	35	·218	96	·22
1967-68	61	·206	43	·307	104	·23
Average for five years	62	·22	56	·41	118	·28

ANNEXURE XI INCIDENCE OF LEVEL CROSSING ACCIDENTS CORRELATED TO DENSITY OF TRAFFIC—YEAR-WISE

Year	Passenger Trains						Goods Trains					
	Broad gauge			Metre gauge			Broad gauge			Metre gauge		
	No.	Rate per million passenger train kilometres		No.	Rate per million passenger train kilometres		No.	Rate per million goods train kilometres		No.	Rate per million goods train kilometres	
						Total						Total
Total for six years												
1957-58 to 1962-63	187	.24		278	.70	..	230	.30		149	.46	..
1963-64	37	.29		49	.66	86	32	.25		30	.60	62
1964-65	31	.23		39	.51	70	31	.247		27	.53	58
1965-66	27	.196		33	.42	60	32	.243		26	.49	58
1966-67	34	.24		24	.29	58	27	.20		11	.21	38
1967-68	37	.25		27	.32	64	24	.17		16	.31	40
Total for five years	166	.24		172	.48	338	146	.22		110	.42	256

ANNEXURE XLI

INCIDENCE OF LEVEL CROSSING ACCIDENTS CORRELATED TO DENSITY OF TRAFFIC—RAILWAY-WISE

Railway	Passenger Trains		Goods Trains		Total	
	No.	Rate per million passenger train kilometres	No.	Rate per million goods train kilometres	No.	Rate per million Train kilometres
Central ..	15	·10	8	·05	23	·07
Eastern ..	24	·18	44	·37	68	·25
Northern ..	61	·31	35	·25	96	·27
North Eastern ..	51	·57	30	·69	81	·56
Northeast Frontier	31	·73	26	·76	57	·64
Southern ..	80	·39	34	·31	114	·35
South Central ..	12	·36	7	·26	19	·30
South Eastern ..	21	·24	38	·31	59	·27
Western ..	43	·26	34	·23	77	·24
Total ..	338	·31	256	·28	594	28

ANNEXURE XLII

INCIDENCE OF FIRES IN PASSENGER AND GOODS TRAINS CORRELATED TO DENSITY OF TRAFFIC

Year	Broad gauge				Metre gauge			
	Passenger trains		Goods Trains		Passenger trains		Goods trains	
	No.	Rate per million passenger train kilometres	No.	Rate per million goods train kilometres	No.	Rate per million passenger train kilometres	No.	Rate per million goods train kilometres
1963-64	53	·41	24	·19	26	·35	9	·18
1964-65	15	·11	6	·05	9	·11	1	·02
1965-66	20	·14	12	·09	10	·11	..	..
1966-67	26	·18	8	·06	18	·22	1	·02
1967-68	18	·12	8	·06	15	·18	1	·02
Total ..	132	·19	58	·09	78	·19	12	·05

ANNEXURE XLIII

INCIDENCE OF FIRES IN TRAINS—RAILWAY-WISE

Railway	Broad gauge		Metre gauge	
	No.	Rate per million train kilometres	No.	Rate per million train kilometres
Central	45	·15	1	·04
Eastern	41	·15	..	..
Northern	17	·06	4	·06
North Eastern .. .. .	..	..	18	·13
Northeast Frontier	2	·18	19	·25
Southern	30	·22	35	·18
South Central	3	·08	10	·38
South Eastern	31	·14	..	..
Western	21	·13	3	·02
Total ..	190	·13	90	·13

ANNEXURE XLIV

INCIDENCE OF FIRES IN PASSENGER AND GOODS TRAINS—GAUGE-WISE

Railway	Broad gauge			Metre gauge			Total (Broad and Metre gauges)		
	Passen-ger trains	Goods trains	Total	Passen-ger trains	Goods trains	Total	Passen-ger trains	Goods trains	Total
Central	31	14	45	1	..	1	32	14	46
Eastern	35	6	41	..	..	..	35	6	41
Northern	13	4	17	2	2	4	15	6	21
North Eastern .. .. .	..	..	..	18	..	18	18	..	18
Northeast Frontier	1	1	2	10	9	19	11	10	21
Southern	21	9	30	35	..	35	56	9	65
South Central	3	..	3	10	..	10	13	..	13
South Eastern	19	12	31	..	..	..	19	12	31
Western	9	12	21	2	1	3	11	13	24
Total ..	132	58	190	78	12	90	210	70	280

ANNEXURE XLV

CAUSES OF FIRES IN GOODS TRAINS

Causes	CR	ER	NR	NER	NFR	SR	SOR	SER	WR	Total
1. Defects or failures of electrical equipment or short-circuiting of electrical wires. Fires originating in Coaching stock	No. A B	.. ..	16.7 33.3	.. ..	.. ..	1 11.1 33.3	.. .. ..	1 8.3 33.4	.. .. ..	3 4.3 100.0
2. Sparks from engines	No. A B	.. ..	.. ..	.. ..	.. ..	4 44.5 40.0	.. .. ..	5 41.7 50.0	.. .. ..	10 14.3 100.0
3. Negligence of passengers & other riders e.g. bidi or cigarette ends carelessly thrown lighting of fires in carriages carrying of inflammable goods etc.	No. A B	4 68.7 33.4	2 33.3 16.6	.. .. ..	4 40.0 33.4	1 11.1 8.3	.. .. ..	.. .. ..	1 7.7 8.3	12 17.1 100.0
4. Negligence of Rly. staff e.g. improper examination or loading of explosives, dangerous or inflammable goods, rough shunting, wrong marshalling, taking naked lights near dangerous goods, etc.	No. A B	2 33.3 14.3	1 16.7 7.1	.. .. ..	2 20.0 14.3	2 22.2 14.3	.. .. ..	1 8.3 7.2	3 23.1 21.4	14 20.0 100.0
5. Accidental e.g. wire contacts due to pilferage of fittings, overheating of points, etc.	No. A B	.. ..	1 16.7 12.5	.. .. ..	2 20.0 25.0	1 11.1 12.5	.. .. ..	4 33.4 50.0	.. .. ..	8 11.4 100.0
6. Cause not determined	No. A B	.. ..	1 16.6 4.4	.. .. ..	2 20.0 8.7	.. .. ..	.. .. ..	1 8.3 4.4	9 68.2 38.0	23 32.8 100.0
7. Cases not finalised	No. A B	....	....	....	....	....	....	....	....	....
8. Total	No. 14 100.0	6 100.0	6 100.0	..	10 100.0	9 100.0	..	12 100.0	13 100.0	70 100.0

A—Percentage of the cause to the total on each Railway.

B—Percentage of the cause on each Railway to the total on all Railways.

ANNEXURE XLVI
INCIDENCE OF PASSENGER AND GOODS TRAIN DERAILMENTS
CORRELATED TO DENSITY OF TRAFFIC
NARROW GAUGE

Year	Passenger Trains		Goods Trains		Total	
	No.	Rate per million passenger train kilometres	No.	Rate per million goods train kilometres	No.	Rate per million train kilometres
1963-64	34	4.8	27	7.3	61	5.3
1964-65	32	4.5	39	10.7	71	6.2
1965-66	26	3.6	31	8.4	57	5.0
1966-67	37	4.8	27	7.8	64	5.5
1967-68	32	4.1	30	8.7	62	5.2
Total	161	4.4	154	8.6	315	5.5

ANNEXURE XLVII
INCIDENCE OF DERAILMENTS CORRELATED TO DENSITY OF
TRAFFIC—RAILWAY-WISE
NARROW GAUGE

Railway	Passenger Trains		Goods Trains		Total (5 years) 1963-64 to 1967-68		Total (six years) 1957-58 to 1962-63	
	No.	Rate per million passenger train kilometres	No.	Rate per million goods train kilometres	No.	Rate per million trains kilometres	No.	Rate per million train kilometre.
Central	52	8.1	16	4.1	68	6.2	148	9.8
Eastern	5	4.7	..	..	5	4.5	..	..
Northern	17	5.0	29	8.1	46	6.7	75	9.9
Northeast Frontier	16	19.5	16	9.1	32	11.9	73	26.8
Southern	8	4.9	5	27.8	13	7.2	8	2.93
South Central	4	4.0	1	1.8	5	3.1	..	..
South Eastern	25	2.2	81	11.0	106	5.2	243	9.8
Western	34	3.1	6	13.9	40	3.3	59	4.16
Total	161	4.4	154	8.6	315	5.5	606	8.8

ANNEXURE XLVIII
CARRIAGE AND WAGON DEFECTS RESULTING IN DERAIL-
MENTS—CLASSIFIED
NARROW GAUGE

Nature of causes	Station	Mid-section	Total
(i) Defective or breakage of spring or suspension	4	19	23
(ii) Defective or breakage of axle box .. .. .	..	9	9
(iii) Broken axle or journal .. .. .	..	6	6
(iv) Defective wheel or tyre	1	11	12
(v) Breakage of undergear or brake fittings	4	6	10
(vi) Other causes .. .. .	..	10	10
Total	9	61	70

ANNEXURE XLIX
THE POSITION OF OVERAGED LOCOMOTIVES AND ROLLING STOCK ON THE NARROW GAUGE

Railway	Steam Locomotives						Carriages in units						Wagons in units					
	As on 31-3-1963			As on 31-3-1968			As on 31-3-1963			As on 31-3-1968			As on 31-3-1963			As on 31-3-1968		
	H.S.		Overaged Stock	H.S.		Overaged Stock	H.S.		Overaged Stock	H.S.		Overaged stock	H.S.		Overaged stock	H.S.		Overaged stock
	No.	%		No.	%		No.	%		No.	%		No.	%		No.	%	
Central ..	92	21	22.8	55	20	36.4	428	290	67.8	210	129	61.4	1,223	799	65.3	817	608	74.4
Eastern ..	4	..	..	19	9	47.0	21	11	52.4	88	88	100.0	3	1	33.3	83	81	97.6
Northern ..	56	27	48.2	49	19	38.8	161	139	86.3	185	132	71.4	280	158	56.4	478	259	54.2
Northeast Frontier	31	20	64.5	31	31	100.0	83	42	50.6	84	28	33.3	458	212	46.3	421	248	50.9
Southern ..	8	3	37.5	10	6	60.0	30	27	90.0	23	10	43.5	98	80	81.6	92	75	81.5
South Central ..	..	..	..	30	10	33.3	..	..	..	* Not available								
South Eastern ..	120	57	47.5	110	62	56.3	500	302	60.4	468	225	48.07	2,385	1,235	51.8	2,339	1,177	50.3
Western ..	97	30	30.9	96	38	39.6	436	185	42.4	803	303	37.7	1,579	617	38.4	2,580	1,035	40.4
All Narrow Gauge Railways ..	408	158	38.7	400	195	48.8	1,659	996	60.0	1,861	915	49.2	6,026	3,102	51.5	6,790	3,483	51.3

* Figures of South Central Railway not available.

NOTE—H.S. stands for 'Holding of stock.'

ANNEXURE L

INCIDENCE OF ACCIDENTS AT LEVEL CROSSINGS CORRELATED
TO DENSITY OF TRAFFIC ON NARROW GAUGE

Year	Passenger trains		Goods trains	
	No.	Rate per million Passenger train kilometres	No.	Rate per million goods train kilometres
1963-64	9	1.28	7	1.9
1964-65	5	0.70	..	..
1965-66	7	0.99	3	0.81
1966-67	5	0.66	3	0.87
1967-68	7	0.90	3	0.87
Total ..	33	0.90	16	0.89

ANNEXURE LI

ACCIDENTS AT LEVEL CROSSINGS—RAILWAY-WISE ON NARROW
GAUGE

Railway	Passenger trains	Goods trains	Total
Central	2	1	3
Northern .. .. .	..	2	2
Northeast Frontier	7	9	16
Southern	3	1	4
South Eastern	4	2	6
Western	17	1	18
Total ..	33	16	49

ANNEXURE LII

INCIDENCE OF BREACH OF BLOCK RULES INVOLVING PASSENGER AND GOODS TRAINS

Year	Passenger Trains				Goods Trains			
	Broad Gauge	Metre Gauge	Total	Rate per million passenger train kilometres	Broad Gauge	Metre Gauge	Total	Rate per million goods train kilometres
1963-64	24	19	43	.21	16	21	37	.21
1964-65	19	16	35	.16	17	22	39	.22
1965-66	9	23	32	.15	13	12	25	.13
1966-67	18	21	39	.17	4	11	15	.08
1967-68	9	6	15	.07	12	14	26	.14
Total ..	79	85	164	.15	62	80	142	.15

ANNEXURE LIII

INCIDENCE OF BREACH OF BLOCK RULES—RAILWAY-WISE

Railway	Broad Gauge		Metre Gauge		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Central	34	24.1	6	3.6	40	13.1
Eastern	13	9.2	..	..	13	4.2
Northern	26	18.5	11	6.7	37	12.1
North Eastern .. ..	..	..	44	26.7	44	14.4
Northeast Frontier .. ..	..	..	23	13.9	23	7.5
Southern	27	19.1	45	27.3	72	23.5
South Central	2	1.5	3	1.8	5	1.6
South Eastern	18	12.7	..	..	18	5.9
Western	21	14.9	33	20.0	54	17.7
Total	141	100.0	165	100.0	306	100.0

ANNEXURE LIV

CAUSES OF BREACH OF BLOCK RULES—ANALYSED

Causes	Broad Gauge			Metre gauge			Total		
	P	G	T	P	G	T	P	G	T
1. Despatching or running of trains without permission to approach having been obtained or despatching a train in an occupied section not resulting in collision or averted collision, or closing the line when the section is not clear or without putting the signals to 'ON' or giving permission to approach when conditions for giving line clear are not fulfilled, or starting on the line clear of another train									
(a) On double line sections :									
(i) equipped with lock and block	6	7	13	1	2	3	7	9	16
(ii) not equipped with lock and block .. ..	..	2	2	..	..	..	..	2	2
(iii) during failure of block instruments .. ..	..	..	..	..	..	..	..	..	..
(b) On single line sections :									
(i) equipped with tokenless or token block instruments	5	3	8	10	6	16	15	9	24
(ii) not equipped with Block instruments .. ..	..	..	..	1	..	1	1	..	1
(iii) during failure of block instruments .. ..	..	..	..	1	..	1	1	..	1
Total	11	12	23	13	8	21	24	20	44

P=Passenger Trains.
G=Goods Trains.
T=Total

ANNEXURE LIV—*contd.*CAUSES OF BREACH OF BLOCK RULES—ANALYSED—*contd.*

	Broad Gauge			Metre Gauge			Total		
	P	G	T	P	G	T	P	G	T
2. Trains entering a section without an authority to proceed or with an incorrect authority to proceed (not resulting in collision or averted collision)									
(a) on double line sections ..	11	9	20	3	2	5	14	11	25
(b) on single line sections ..	21	18	39	41	58	99	62	76	138
Total ..	32	27	59	44	60	104	76	87	163
3. Reception of trains on blocked lines, or wrong lines or despatching them into a wrong line by incorrect setting of points (not resulting in collision or averted collision)									
(a) on double line sections ..	21	7	28	2	1	3	23	8	31
(b) on single line sections ..	9	7	16	16	11	27	25	18	43
Total ..	30	14	44	18	12	30	48	26	74
4. Miscellaneous causes :									
(a) on double line sections ..	6	6	12	1	..	1	7	6	13
(b) on single line sections ..	..	3	3	9	..	9	9	3	12
Total ..	6	9	15	10	..	10	16	9	25
5. Total Block Irregularities ..	79	62	141	85	80	165	164	142	306

ANNEXURE LV NATURE AND EXTENT OF BLOCK IRREGULARITIES—RAILWAY-WISE

Causes (Broad & Metre gauge)		CR	ER	NR	NER	NFR	SR	SCR	SER	WR	Total
1. Despatching or running of trains without permission to approach	No.	14	2	2	2	..	5	1	5	13	44
	A	35.0	15.3	5.4	4.55	..	6.95	20.0	27.8	24.07	14.38
	B	31.82	4.55	4.55	4.55	..	11.36	2.27	11.36	29.54	100.0
<p>chasing a train in an occupied section not resulting in collision or averted collision or closing the line when the section is not clear or without putting the signals to 'ON' or giving permission to approach when conditions for giving line clear are not fulfilled, or starting a train on the line clear of another train.</p>											
2. Trains entering a section without an authority to proceed or with an incorrect authority to proceed (not resulted in collision or averted collision).	No.	23	3	12	30	20	43	4	6	22	163
	A	57.5	23.1	32.43	08.18	86.96	59.12	80.0	33.3	40.74	53.27
	B	14.11	1.84	7.36	18.4	12.27	26.39	2.45	3.68	13.5	100.0
3. Reception of trains on blocked lines, or wrong lines or despatching them into a wrong line by incorrect setting of points (not resulting in collision or averted collision)	No.	3	5	18	7	3	21	..	7	10	74
	A	7.5	38.5	48.65	15.91	13.04	29.16	..	38.9	18.52	24.18
	B	4.05	6.76	24.32	9.47	4.05	28.36	..	9.47	13.52	100.0
4. Miscellaneous	No.	..	3	5	5	..	3	..	..	9	25
	A	..	23.1	13.52	11.36	..	4.17	..	..	16.67	8.17
	B	..	12.0	20.0	20.0	..	12.0	..	..	36.0	100.0
5. Total Block Irregularities	No.	40	13	37	44	23	72	5	18	54	306
	A	100	100	100	100	100	100	100	100	100	100
	B	13.07	4.25	12.09	14.38	7.52	23.63	1.63	5.88	17.65	100.0

A—Percentage of cause to the total on each Railway.

B—Percentage of cause on each railway to the total on all Railways.

ANNEXURE LVI
INCIDENCE OF DISREGARD OF SIGNALS

Year					Broad Gauge		Metre Gauge		Total	
					A	B	A	B	A	B
1963-64	..	..	..	..	142	·53	45	·34	187	·46
1964-65	..	..	..	..	151	·55	37	·27	188	·45
1965-66	..	..	..	..	141	·49	44	·31	185	·43
1966-67	..	..	..	..	132	·45	30	·21	162	·37
1967-68	..	..	..	..	134	·45	39	·28	173	·40
Total	..	..	..	..	700	·49	195	·28	895	·42

A=Number of cases of disregard of signals.

B=Rate per million train kilometres.

ANNEXURE LVII

DISREGARD OF SIGNALS BY PASSENGER AND GOODS TRAINS ON BROAD GAUGE AND METRE
GAUGE SYSTEMS OF DIFFERENT RAILWAYS WITH CORRELATION TO DENSITY OF TRAFFIC

Railway	Broad Gauge						Metre Gauge						Total						Grand Total			
	Passenger			Goods			Passenger			Goods			Passenger			Goods			A		C	
	A		B	A	B	C	A		B	A	B	C	A		B	A	B	C	A		C	
	A	B		A	B	C	A	B		A	B	C	A	B		A	B		A	B	C	D
Central	44	0.33	68	0.46	..	..	..	5	0.6	..	44	0.3	73	0.5	117	0.37	..	..	..	..
Eastern	15	0.10	36	0.30	..	..	..	..	..	..	15	0.10	36	0.30	51	0.18	..	..	..	..
Northern	55	0.34	81	0.7	1	0.03	1	0.04	..	..	56	0.28	82	0.6	138	0.39	..	..	..	..
North Eastern	42	0.5	49	1.1	..	..	42	0.47	49	1.1	91	0.63	..	..	..	..
Northeast Frontier	1	0.2	3	0.6	7	0.2	19	0.6	..	..	8	0.19	22	0.6	30	0.34	..	..	..	..
Southern	37	0.47	39	0.78	14	0.1	16	0.3	..	..	51	0.25	55	0.5	106	0.32	..	..	..	..
South Central	9	0.47	9	0.58	2	0.1	4	0.4	..	..	11	0.32	13	0.5	24	0.39	..	..	..	..
South Eastern	30	0.4	98	0.79	—	—	—	—	..	..	30	0.4	98	0.79	128	0.63	..	..	..	..
Western	84	1.0	91	1.2	13	0.2	22	0.3	..	..	97	0.58	113	0.75	210	0.65	..	..	..	..
Total	275	0.4	425	0.64	79	0.2	116	0.5	..	..	354	0.33	541	0.6	895	0.42	..	..	..	..

A—Number of cases.

B—Rate per million passenger train kilometres.

C—Rate per million Goods train kilometres.

D—Rate per million train kilometres.

ANNEXURE LVIII
TYPES OF SIGNALS DISREGARDED

Signals Disregarded	1957-58 to 1962-63				1963-64 to 1967-68			
	Broad Gauge		Metre Gauge		Broad Gauge		Metre Gauge	
	No.	%	No.	%	No.	%	No.	%
Approach signals ..	264	25.2	80	35.4	196	28.0	74	38.0
Departure signals ..	490	46.7	36	15.9	294	42.0	61	31.2
Two or more signals simultaneously ..	141	13.4	56	24.7	111	15.9	47	24.1
Automatic and semi-automatic signals, Manual stop signals, gate signals on automatic territory	Not classified separately, included in other signals				47	6.7	..	..
Engineering signals	64	6.1	20	8.9	45	6.4	9	4.7
Gate and other signals	90	8.6	34	15.0	7	1.0	4	2.0
Total ..	1049	100.0	226	100.0	700	100.0	195	100.0

ANNEXURE LIX
INCIDENCE OF DISREGARD OF DIFFERENT TYPES OF SIGNALS—RAILWAY-WISE

Signals disregarded	Broad Gauge										Broad Gauge									
	Passenger Trains										Goods Trains									
	C	E	N	NE	NF	S	SC	SE	W	Total	C	E	N	NE	NF	S	SC	SE	W	Total
1. Approach signals	21	4	15	..	1	19	6	13	12	91	29	3	9	..	2	26	7	16	13	105
2. Departure signals	17	3	35	..	..	8	2	9	26	100	17	25	71	..	..	6	2	47	26	194
3. Two or more signals simultaneously:																				
(a) Outer & home	2	3	2	..	..	..	1	2	4	14	5	3	..	..	1	..	..	10	2	21
(b) Outer, Home & starter ..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	2	7	10
(c) Outer, Home, starter & Advanced Starter ..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	2
(d) Home & Starter ..	..	..	..	..	..	..	..	..	9	9	2	2	..	..	..	2	..	2	16	24
(e) Home, Starter & Advanced Starter ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(f) Starter & Advanced Starter ..	..	1	..	..	..	4	..	..	3	8	6	2	..	..	..	1	..	8	4	21
Total (a+b+c+d+e+f) ..	2	4	3	..	..	4	1	2	17	33	15	7	..	..	1	3	..	23	29	78

Automatic &
Semi-automatic
signals, Manual
Stop signals, gate
signals on auto-
matic territory

5. Engineering sig- nals ..	3	..	..	..	3	..	5	9	20	2	..	..	..	..	..	10	13	25
6. Gate & other sig- nals ..	..	..	..	..	2	..	..	1	3	2	..	1	..	..	..	..	1	4
7. Total	..	44	15	55	..	1	37	9	30	84	275	68	36	81	..	3	39	9	98	91	425

Signals disregarded	Metre Gauge													Metre Gauge												
	Passenger Trains													Goods Trains												
	C	N	NE	NF	S	SC	W	Total	C	N	NE	NF	S	SC	W	Total	C	N	NE	NF	S	SC	W	Total		
1. Approach Signals	13	3	6	2	1	25	5	..	18	11	6	4	5	49	
2. Departure Signals	..	1	17	2	4	..	5	29	..	1	16	2	7	..	6	32	..	..	..	..	..	..	..	..
3. Two or more signals simultaneously :																										
(a) Outer & Home	11	2	1	..	1	15	..	..	9	6	2	..	2	19	..	..	..	..	..	..	..	..
(b) Outer, Home & Starter	1	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
(c) Outer, Home, Starter and Advanced Starter	3	3	..	..	..	..	..	..	..
(d) Home and Starter	4	4	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..
(e) Home, Starter and Advanced Starter		
(f) Starter and Advanced Starter	1	..	1	..	..	2	..	..	..	..	..	..	..	..
Total (a+b+c+d+e+f)	11	2	1	..	6	20	..	..	10	6	3	..	8	27	..	..	..	..	..	..	..	..

ANNEXURE LIX—*concl'd.*

Signals disregarded	Metre Gauge															
	Passenger Trains					Goods Trains										
	C	N	NE	NF	S	SC	W	Total	C	N	NE	NF	S	SC	W	Total
4. Automatic or semi-automatic signals, Manual Stop signals, gate signals on automatic territory
5. Engineering signals	2	..	1	3	..	..	3	..	..	..	3	6
7. Gate and other signals	1	..	1	..	..	2	..	..	2	..	..	..	..	2
8. Total	..	1	42	7	14	2	13	79	5	1	49	19	16	4	22	116

ANNEXURE LX

INCIDENCE OF DISREGARD OF SIGNALS ACCORDING TO TYPES OF SIGNALLING

Particulars of signalling	Broad gauge										Metre gauge									
	Broad gauge					Total					Broad gauge					Total				
	C	E	N	NE	NF	S	SC	SE	W	Total	C	N	NE	NF	S	SC	W	Total		
Two Aspect Lower Quadrant Semaphore Signalling	No. 89	26	125	..	3	41	15	94	96	489	5	2	48	24	23	6	31	139		
	% 88.1	56.5	94.0	..	75.0	62.1	83.3	85.5	78.0	81.4	100.0	100.0	58.5	92.3	85.2	100.0	100.0	77.6		
Multiple Aspect Upper Quadrant Signalling	No. 12	..	6	..	1	22	3	..	21	65	..	..	24	1	2	..	..	27
	% 11.9	..	4.5	..	25.0	33.3	16.7	..	17.1	10.8	..	..	29.3	3.8	7.4	..	..	15.1
Colour light Signalling	No. ..	4	2	..	..	3	..	1	..	10	..	..	..	..	1	..	..	1
Two-aspect ..	% ..	8.7	1.5	..	..	4.6	..	0.9	..	1.7	..	..	..	..	3.7	..	..	0.6
Multiple Aspect Colour light Signalling	No. ..	16	..	..	..	..	..	15	6	37	..	..	10	1	1	..	..	12
	% ..	34.8	..	..	..	..	..	13.6	4.9	6.1	..	..	12.2	3.9	3.7	..	..	6.7
Total	101	46	133	..	4	66	18	110	123	601	5	2	82	26	27	6	31	179		

ANNEXURE LXI

SERVICE PARTICULARS OF DRIVERS HELD RESPONSIBLE FOR DISREGARD OF SIGNALS DURING THE FIVE YEARS 1963-64 TO 1967-68

	Central					North-eastern			South Central			South Western		All Railways Number Percentage
	Central	Eastern	North-eastern	North-eastern	Frontier	Central	Eastern	Frontier	Central	Eastern	Frontier	South Western	South Western	
1. Total number of Drivers primarily held responsible for disregard of signals	117	52	84	85	30	73	9	110	122	682				
2. Total Service as a Driver														
(i) Less than 5 years	43	16	24	26	20	18	5	38	43	233	34.2			
(ii) 5 to 10 years	31	13	26	29	7	14	..	28	27	175	25.7			
(iii) 10 to 15 years	29	12	24	13	..	9	3	15	18	123	18.0			
(iv) Above 15 years	13	11	10	17	3	32	1	29	34	150	22.0			
(v) Service Record not available	1	..	..	..	..	..	..	..	..	1	0.1			
3. Service Record during 3 years to an accident														
(i) Number of Drivers with previous punishments for disregard of signals	12	1	7	5	..	5	..	10	10	50	7.4			
(ii) Number of drivers with previous punishments for other irregularities resulting in accidents	25	3	22	43	11	25	1	20	10	160	23.3			
(iii) Number of Drivers with previous punishments for defaults other than those under items (i) & (ii)	35	8	28	25	12	15	1	55	42	221	32.4			
(iv) Number of Drivers with no punishments	38	40	27	12	7	28	7	25	60	244	35.9			
(v) Service record not available	7	..	..	..	..	..	..	..	..	7	1.0			

ANNEXURE LXII

INCIDENCE OF AVERTED COLLISIONS—RAILWAY-WISE

Railway	Broad Gauge		Metre Gauge	
	Number	Rate per million train kilometres	Number	Rate per million train kilometre
Central	46	·16	2	·09
Eastern	14	·05	..	..
Northern	34	·12	4	·06
North Eastern .. .. .	..	..	26	·18
Northeast Frontier	3	·26	26	·33
Southern	22	·16	16	·08
South Central	6	·17	2	·07
South Eastern	13	·06	..	..
Western	19	·12	13	·08
Total	157	·11	89	·13

ANNEXURE LXIII

TYPES OF AVERTED COLLISIONS—RAILWAY-WISE

Railway	Between two trains including between a train and light engine		Between a train and shunting engine or vehicles during shunting		Between a train & a rake or vehicles or load stalled on a running line		Between a train and buffer ends or other stationary objects		Between a train and trolley or lorry		Total	
	BG	MG	BG	MG	BG	MG	BG	MG	BG	MG	BG	MG
Central	26	2	5	..	14	..	..	..	1	..	46	2
Eastern	11	..	..	..	3	..	..	..	..	..	14	..
Northern	12	1	6	1	16	2	..	..	..	..	34	4
North Eastern .. .. .	..	18	..	2	..	6	..	..	..	..	..	26
Northeast Frontier	3	18	..	4	..	4	..	..	..	..	3	26
Southern	18	14	2	..	2	2	..	..	..	..	22	16
South Central	5	1	..	..	1	1	..	..	..	..	6	2
South Eastern	11	..	2	..	..	..	..	..	..	..	13	..
Western	18	3	..	3	1	5	..	1	..	1	19	13
Total	104	57	15	10	37	20	..	1	1	1	157	89

ANNEXURE LXIV

SERIOUS ACCIDENTS—CAUSE-WISE ANALYSIS

Causes	TABLE I 1957 to 1962			TABLE II 1963-64 to 1967-68		
	Total number of accidents	Percen- tage of the total accidents	Percen- tage of item 5	Total number of accidents	Percen- tage of the total accidents	Percen- tage of item 5
1. Drivers disregarding signals or running at excessive speeds or violating safety rules.	22	29.7	39.3	21	26.6	37.5
2. Station staff responsible for incorrect setting of points on receiving/despatching trains on blocked lines or sections	18	24.3	32.1	12 plus *1	16.5	23.2
3. Accidents caused by wilful tampering with track or other acts of sabotage e.g. blowing up of tracks/bridges or vehicles	12	16.2	21.4	17	21.6	30.4
4. Accidents at road level crossings :						
(i) caused by failure of railway staff ..	1	1.4	1.8	..	..	..
(ii) caused by road users	3	4.1	5.4	5	6.3	8.9
5. Total of the above four categories ..	56	75.7	100.0	56	71.0	100.00
6. Defects in engines ..	2	2.7	..	1	1.3	..
7. Failure of rolling stock ..	3	4.0	..	2	2.5	..
8. Failure of track ..	4	5.4	..	3	3.8	..
9. Fires in trains ..	2	2.7	..	3	3.8	..
10. Rash acts of travelling public or outsiders	2	2.7	..	3	3.8	..
11. Accidents caused by natural calamities e.g. unprecedented floods, tidal waves, etc. ..	..	..	..	3	3.8	..
12. Explosions in trains not caused with the intention of sabotage ..	..	..	..	2	2.5	..
13. Miscellaneous causes ..	5	6.8	..	4	5.0	..
14. Cause could not be determined by the ACRS .. ..	..	..	..	2	2.5	..
15. Grand Total ..	74	100.00	..	79	100.00	..

*One accident was inquired into by a Commission of Inquiry.

ANNEXURE LXV

CASUALTIES AND DAMAGES IN SERIOUS ACCIDENTS

1963-64 TO 1967-68

Causes	TABLE—III 1957 to 1962						TABLE—IV 1963-64 to 1967-68					
	Casualties			Damage			Casualties			Damage		
	Killed		Injured		Amount in Re.		Killed		Injured		Amount in Re.	
	Number	Per-centage of total	Number	Per-centage of total	Per-centage of total	Per-centage of total	Number	Per-centage of total	Number	Per-centage of total	Per-centage of total	Per-centage of total
1. Drivers disregarding signals or running at excessive speed or violating safety rules ..	100	31.9	633	35.2	9,39,933	25.8	114	15.4	505	22.2	23,61,275	24.4
2. Station staff responsible for incorrect setting of points or receiving/despatching trains on blocked lines or sections ..	66	21.2	420	23.3	7,00,803	19.5	126	17.1	635	28.0	27,43,057	28.4
3. Accidents caused by wilful tampering with track ..	103	32.9	578	32.0	15,80,274	43.3	210	28.4	618	27.2	18,98,109	19.6
4. Accidents at road level crossings ..	4	1.2	27	1.5	28,645	0.8	10	1.3	54	2.4	13,410	0.2
5. Total of the above ..	273	87.2	1,658	92.0	32,58,661	89.4	460	62.2	1,812	79.8	70,15,851	72.6
6. Other Causes ..	30	12.8	144	8.0	3,88,004	10.6	279	37.8	459	20.2	26,44,007	27.4
7. Grand Total ..	312	100.0	1,802	100.0	36,46,665	100.0	739	100.0	2,271	100.0	96,59,858	100.0

ANNEXURE LXVI STATEMENT SHOWING PERCENTAGE OF UTILISATION OF TRAINING FACILITIES

Particulars	Central		Eastern		Northern		North Eastern		Northeast Frontier		South Eastern		Western	
	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68
8. Operating:														
(a) Class III Staff ..	95.0	67.0	51.1	62.5	96.0	45.0	72.5	60.4	55.9	69.5	84.8	53.7	No figure given	
(b) Class IV Staff ..	70.5	83.6	54.6	66.0	66.0	84.0	69.5	47.7	..	43.0	{ Above } 100.0	70.0	72.0	76.4
2. Loco Running Staff:														
(a) Drivers ..	69.7	55.6	82.5	86.5	73.0	48.0	53.0	89.9	116.0	34.4	..	..	100.0	100.0
(b) Shunters & Firemen ..	88.0	88.0	90.9	87.2	71.0	46.0	62.1	67.9	53.0	47.3	..	..	89.6	85.4
3. Carriage & Wagon Staff:														
(a) Train Examiners ..	88.0	49.0	80.5	83.8	51.0	57.0	66.0	35.9	21.0	61.0	37.0	65.0	63.0	78.1
(b) Carriage & Wagon fitters ..	95.1	90.6	..	..	No training	..	26.2	36.3	21.0	..	..	..	100.0	100.0
4. Permanent Way Staff:														
(a) Class III Staff ..	108.0	57.0	24.8	23.3	31.0	19.0	35.0	40.0	26.0	23.5	44.0	94.0	No figures given	
(b) Class IV Staff ..	101.0	77.0	105.7	74.7	Included in Item 1 (b)	..	No figures given	No training	..	..	{ Above } 100.0	{ Above } 100.0	94.4	94.4
5. Signalling & Interlocking Staff Maintainers ..	91.0	85.0	46.6	60.0	70.0	75.0	85.5	119.7	78.3	95.8	..	..	100.0	..
Total capacity ..	..	..	58.0	65.9	88.0	46.0	69.3	65.9	59.3	64.5	No figures given	No figures given	41.6	50.7
6. (a) Class III Staff ..	88.1	74.5	61.6	68.0	66.0	84.0	52.2	51.2	96.0	44.3	No figures given	No figures given	73.6	77.7
(b) Class IV Staff ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Notes: (1) Southern Railway did not supply the requisite information.

(2) The staff of South Central Railway are sent to Zonal Training Schools of the Central and the Southern Railways.

8. Block Signal or Electric Signal Maintainers for maintenance of track circuits, route relay interlocking, centralised traffic control, automatic block signalling

(i) Apprentice
Signal main-
tainers
(Matric)
(ii) Trade
Apprentice
Signal main-
tainers (Elec)
VIII Std.

No separate information given

(a) Educational qualifications prescribed	VIII Std. Artisan main- tainers (Elec). VIII Std.	Grade 110— 180 up to VIII Standard Grade 130— 212	Nothing specified	Matric	Matric with technical qualifications	No Information given	No Information given
(b) Duration of initial training	(i) 2 years (ii) 3½ years (iii) 1 year	18 months	Not mentioned	2 months	1 month	No Information given	No Information given
(c) Duration of Refresher training	10 days	2 months	2 months	45 days	1 month	No Information given	No Information given
(d) Periodicity of Refresher training	Nothing mentioned	Nothing mentioned	Nothing mentioned	Nothing mentioned	Nothing mentioned	No Information given	No Information given
9. Maintainers employed at places other than above—							
(a) Educational qualifications prescribed	nil	VIII Std.	Nothing mentioned	Same as above	Same as above	No Information given	No Information given
(b) Duration of initial training	nil	18 months	Nothing mentioned	Nothing mentioned	Nothing mentioned	No Information given	No Information given
(c) Duration of Refresher training	nil	2 months	Nothing mentioned	Nothing mentioned	Nothing mentioned	No Information given	No Information given
(d) Periodicity of Refresher training	nil	Nothing mentioned	Nothing mentioned	Nothing mentioned	Nothing mentioned	No Information given	No Information given

Note South Central Railway follows the policies Central and Southern Railway in the portions taken from each of these

ANNEXURE LXVIII

PERCENTAGE OF SHORTFALL AS BETWEEN THE STAFF DUE TO ATTEND THE REFRESHER COURSES:

(a) ON 1-4-1966 AND THOSE ACTUALLY ATTENDED UPTO 31-3-1967
 (b) ON 1-4-1967 AND THOSE ACTUALLY ATTENDED UPTO 31-3-1968

Sl. Categories No. of Staff	Central	Eastern	Northern	North Eastern	Northeast Frontier	Southern	South Central	South Eastern	Western	All Railways																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 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67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 67	1966. 6

	12. Shunters ..	32.4	28.7	No Refresher Course.	78.2	75.5	65.9	81.4	73.0	91.9	No figures	40.0	..	56.0	18.2	41.2	12.5	46.4	35.8
13. Asstt. Drivers and Firemen ..					70.7	57.2	84.5	80.1	..	..	No figures	12.8	18.0	72.4	16.0	34.9	4.3		
14. Train Examiners ..	60.6	89.6	21.3	17.7	70.2	76.7	72.8	51.1	88.8	63.2	30.0	53.0	73.0	86.0	30.1	36.3	2.8	..	52.1
15. Carriage and wagon fitters	No Refresher Course.				..	..	74.8	24.4	98.1	99.5	No figures	53.0	22.0	No Refresher Course.				75.0	40.0
16. Permanent Way and Assistant Permanent Way Inspectors ..	..	17.5	75.1	76.6	95.4	91.4	78.8	98.9	..	88.0	89.0	61.0	86.0	80.0	10.0	8.0	40.6	49.0	62.5
17. Gangmates	10.1	18.0	..	..	21.3	20.2	80.4	77.5	82.0	71.0	..	..	83.0	83.0	57.8	13.0	37.4	66.0	..
18. Keymen ..	No Refresher Course.	..	..	..	35.3	9.6	81.0	78.3	No training	76.0	69.0	92.0	64.0	58.0	15.3	60.7	71.8	56.1	51.1
19. Permanent Way Mistries	27.1	21.6	32.1	38.8	49.2	77.5	92.0	69.4	100.0	54.0	..	..	86.0	90.0	..	..	19.0	10.7	..
20. Gatemen	No Refresher Course.	..	..	..	..	..	..	..	No training.	78.0	71.0	..	..	14.2	..	45.0	7.0	33.5	7.8
21. Block Signal & Electric Signal Maintainers ..	55.8	15.8	100.0	90.0	73.0	84.5	55.6	48.0	25.0	16.6	79.0	54.0	89.0	66.0	24.5	36.6	..	..	..
22. Mechanical Signal Maintainers ..	63.8	30.4	86.3	86.1	77.4	77.7	53.4	41.3	12.0	..	55.0	8.0	91.0	44.0	23.2	33.0	..	..	68.9
23. Block Signal & Interlocking Inspectors ..	50.7	61.1	97.0	95.0	78.4	77.8	80.0	87.8	..	..	73.0	58.0	69.0	71.0	76.5	81.0	78.0	63.0	..

ANNEXURE LXIX

DIRECT RECRUITMENT TO INTERMEDIATE GRADES OF CERTAIN CATEGORIES OF CLASS III STAFF DURING 1965-66 TO 1967-68.

Railways	Percentage prescribed by		1965-66		1966-67		1967-68	
	Railways	Railway Board	B		A		A	B
TRAFFIC APPRENTICES								
Central	25	25	7	50	14	140	14	233
Eastern	25	25	14	33-1/3	9	13	8	66-2/3
Northern	75	25	8	2	12	3	8	2
North Eastern ..	25	25	8	15	1	5	11	48
Northeast Frontier	25	25	4	25	1	25	3	25
Southern	25	25	11	25	18	25	15	25
South Central ..	25	25	4	..	2	..	..	..
South Eastern ..	25	25	13	11	13	45	15	28
Western	25	25	16	64	2	25	2	25
ASSISTANT SIGNAL & BLOCK INSPECTORS								
Central	25	..	8	25	1	25	..	..
Eastern	40	1	14	14	2	2-1/2	3	3-1/2
Northern	66-2/3	40	2	125	2	1-25	24	16
North Eastern ..	40	40	..	..	3	22	1	100
Northeast Frontier	40	40	..	..	..	..	..	..
Southern	40	40	79	..	..	..	..	..
South Central ..	40	40	..	..	..	..	..	..
South Eastern ..	40	40	..	..	..	..	..	..
Western	40	40	..	..	..	..	..	..
ASSISTANT PERMANENT WAY INSPECTORS								
Central	75	75	14	70	..	..	..	..
Eastern	75	75	..	..	..	..	..	..
Northern	75	75	..	..	29	6-75	..	..
North Eastern ..	75	75	9	35	..	..	16	100
Northeast Frontier	75	75	..	..	3	75	14	75
Southern	75	75	143	..	..	..	..	..
South Central ..	75	75	6	..	2	..	..	..
South Eastern ..	..	75	..	..	..	..	..	..
Western	75	75	..	..	..	..	..	..
MECHANICAL CHARGE-MEN								
Central	25	80	..	..	..	..	4	65
Eastern .. ..	..	(of App. Mech-nics.)	..	..	..	..	..	..
Northern .. ..	..	..	..	..	..	..	..	..
North Eastern ..	60	Do.	12	86	14	100	14	48
Northeast Frontier	80	Do.	..	..	..	..	..	..
Southern	60	Do.	80	..	..	..	..	..
South Central ..	60	Do.	7	..	3	..	..	..
South Eastern ..	40	Do.	..	..	..	..	..	..
Western	60	Do.	..	..	26	13	..	..

ANNEXURE LXIX—*contd.*

Railways	Percentage prescribed by		1965-66		1966-67		1967-68	
	Rail-ways	Rail-way Board	A	B	A	B	A	B
TRAIN EXAMINERS								
Central	50	80	27	45	19	87	..	..
Eastern .. ..	..	80	..	..	..	..	..	..
Northern	50	80	6	3	..	..	..	..
North Eastern ..	37-1/2	80	1	100	..	..	9	100
Northeast Frontier	50	80	..	..	..	..	..	..
Southern	37-1/2	80	9	..	8	..	7	..
South Central ..	50	80	..	..	..	..	24	..
South Eastern ..	..	80	..	..	..	..	..	..
Western	37 1/2	80	18	22.5	..	..	..	..
FIREMEN GRADE I								
Central	80	75	..	..	..	..	..	..
Eastern	75	75	..	..	..	..	..	..
Northern	75	75	21	15.75	..	..	68	51
North Eastern ..	75	75	51	100	44	100	2	100
Northeast Frontier	75	75	6	75	2	75	..	..
Southern	75	75	49	75	..	..	..	..
South Central ..	75	75	8	..	6	..	31	..
South Eastern ..	..	75	..	..	..	..	..	..
Western	75	75	..	..	30	20.5	..	..
INSPECTORS OF WORKS*								
Central	25	25	6	43	..	..	..	..
Eastern	25	25	..	..	..	..	..	..
Northern	25	25	..	..	..	..	..	..
North Eastern ..	25	25	..	..	3	100	2	8
Northeast Frontier	25	25	..	..	..	..	..	..
Southern	25	25	4	..	..	..	..	..
South Central ..	25	25	..	..	..	..	..	..
South Eastern ..	25	25	..	..	..	..	..	..
Western	25	25	..	..	1	5	..	..
BLOCK SIGNAL AND TELECOMMUNICATION INSPECTORS*								
Central	25	25	3	12	..	..	..	..
Eastern	25	25	..	..	6	20.5	..	..
Northern	25	25	3	0.5	3	0.5	4	0.5
North Eastern ..	25	25	..	..	..	..	..	..
Northeast Frontier	25	25	2	25	..	..	..	..
Southern	25	25	2	..	..	..	..	..
South Central ..	25	25	..	..	..	..	..	..
South Eastern ..	25	25	..	..	..	..	..	..
Western	25	25	..	..	2	7.1	..	..

ANNEXURE LXIX—*concl'd.*

Railways	Percentage prescribed by		1965-66		1966-67		1967-68	
	Rail-ways	Rail-way Board	A	B	A	B	A	B
<hr/>								
MOTORMEN								
Western	100	..	..	..	4	23.52	9	32.14

NOTE: No direct recruitment to this category on other railways.

A: Number of staff recruited direct.

B: Percentage of staff recruited direct.

*Engineering graduates are recruited as Inspectors of Works & Block Signal and Telecommunication Inspectors only.

NOTE: Southern Railway has not furnished the information asked for in the proper form.

ANNEXURE LXX
EXERCISE OF DISCIPLINARY POWERS BY SENIOR SUPERVISORS DURING 1967-68.

Serial No.	Category/Railways	No. of Super-visors in the category	No. of Super-visors who exercised disciplinary Powers	Class III					Class IV				
				No. of Staff punished with stoppage of Passes and PTOs	No. of staff censured	No. of staff warned	Total	No. of staff punished with stoppages of Passes and PTOs	No. of staff punished with fines	No. of staff censured	No. of staff warned	Total	
2		3	4	5	6	7	8	9	10	11	12	13	14
1 Permanent Way Inspectors :													
	Central	130	37	—	9	7	29	45	1	2,267	360	1,034	3,662
	Eastern	134	68	5	—	—	—	5	73	123	134	216	546
	Northern	142	73	24	11	25	56	116	250	152	173	377	952
	North Eastern	74	20	—	—	—	—	—	2	11	14	106	133
	Northeast Frontier	45	2	—	—	—	8	8	—	—	—	—	—
	Southern	134	72	7	13	14	56	90	143	441	194	372	1,150
	South Central	68	55	—	4	—	—	4	1	62	79	190	332
	South Eastern	106	31	8	6	11	3	28	6	130	40	73	249
	Western	132	87	10	2	7	16	35	161	130	164	227	682
	All Railways No.	965	495	54	45	64	168	331	637	3,316	1,158	2,595	7,706
	Percentage	..	..	16.3	13.6	19.3	50.8	..	8.3	43.0	15.0	33.7	..
2 Loco Foremen :													
	Central	95	21	—	605	65	103	773	—	2,204	107	328	2,639
	Eastern	35	26	97	113	143	522	875	245	225	664	1,684	2,818
	Northern	46	43	287	39	189	310	825	622	74	976	1,202	2,874
	North Eastern	26	1	4	—	5	1	10	7	—	20	—	27
	Northeast Frontier	41	3	—	—	—	10	10	—	—	—	52	52
	Southern	43	14	43	26	47	82	198	108	84	219	167	578
	South Central	19	12	76	116	143	356	691	279	621	239	2,852	3,991
	South Eastern	88	27	164	90	273	739	1,266	646	576	1,319	1,329	3,870
	Western	40	32	514	44	602	842	2,002	1,539	259	1,949	1,910	5,657
	All Railways No.	433	179	1,185	1,033	1,467	2,965	6,650	3,446	4,043	5,493	9,524	22,506
	Percentage	..	..	17.8	15.4	22.1	44.7	..	15.3	17.9	24.4	42.4	..

ANNEXURE LXX—contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
3 Station Superintendents (N.G.) and Senior Station Masters:													
Central	..	76	16	—	6	11	37	54	—	77	33	139	249
Eastern	..	58	17	—	4	1	16	21	96	158	49	189	492
Northern	..	138	75	26	35	137	220	418	295	89	178	454	1,016
North Eastern	..	68	2	—	—	—	30	30	—	—	2	16	18
Northeast Frontier	..	52	—	—	—	—	—	—	—	—	—	—	—
Southern	..	125	62	8	11	41	59	119	9	165	229	206	609
South Central	..	32	18	—	—	—	—	—	—	21	4	32	57
South Eastern	..	40	17	41	29	12	17	99	306	224	43	57	630
Western	..	118	55	60	—	59	38	157	101	18	71	132	322
All Railways No.	..	707	262	135	85	261	417	808	807	752	609	1,225	3,393
Percentage	15.0	9.5	29.1	46.4	..	23.8	22.1	18.0	36.1	..
4 Traffic and Transportation Inspectors:													
Central	..	30	2	—	—	—	—	—	—	—	17	31	48
Eastern	..	45	17	4	—	—	2	6	14	7	1	8	30
Northern	..	75	40	3	—	128	137	268	90	23	110	504	727
North Eastern	..	57	—	—	—	—	—	—	—	—	—	—	—
Northeast Frontier	..	27	2	—	—	—	—	—	4	7	3	—	14
Southern	..	45	11	—	—	—	14	14	14	72	44	56	186
South Central	..	23	6	—	—	—	8	8	—	20	10	5	41
South Eastern	..	28	10	—	1	6	29	36	6	10	18	69	103
Western	..	52	24	—	—	14	65	79	37	22	62	398	519
All Railways No.	..	382	112	7	1	148	255	411	165	167	265	1,071	1,668
Percentage	1.7	0.2	36.0	62.1	..	9.9	10.0	15.9	64.2	..

ANNEXURE LXX—concl'd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	Block and Signal Inspectors												
	Central ..	88	26	—	31	48	84	163	—	25	37	61	123
	Eastern ..	33	16	11	12	14	7	44	24	29	33	33	119
	Northern ..	79	46	29	5	31	33	98	50	14	50	119	233
	North Eastern ..	29	3	4	—	—	6	10	6	—	—	8	14
	Northeast Frontier ..	15	8	1	—	5	13	19	5	—	15	25	45
	Southern ..	89	34	20	39	11	22	92	4	11	3	17	35
	South Central ..	20	8	—	5	8	2	15	—	4	8	23	35
	South Eastern ..	42	35	20	24	41	87	172	10	9	23	32	74
	Western ..	34	19	17	—	11	12	40	44	—	19	71	134
	All Railways No.	429	195	102	116	169	266	653	143	92	188	389	812
	Percentage ..			15.6	17.9	25.8	40.7		17.6	11.3	23.1	48.0	
6	Head Train Examiners and Carriage and Wagon Foremen :												
	Central ..	44	14	—	38	19	34	91	—	259	79	86	424
	Eastern ..	54	38	6	16	17	20	59	50	65	55	160	330
	Northern ..	77	40	29	23	117	145	314	150	71	263	558	1,042
	North Eastern ..	13	—	—	—	—	—	—	—	—	—	—	—
	Northeast Frontier ..	22	7	—	—	—	7	7	—	—	—	42	42
	Southern ..	26	14	38	2	15	15	70	32	55	94	102	283
	South Central ..	15	10	1	9	5	36	51	1	239	101	150	491
	South Eastern ..	153	30	33	15	51	54	153	79	44	124	70	317
	Western ..	34	21	23	7	24	26	80	83	62	77	83	305
	All Railways No.	438	174	130	110	248	337	825	395	795	793	1,251	3,234
	Percentage ..			15.8	13.3	30.1	40.8		12.2	24.6	24.5	38.7	

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ANNEXURE LXXI

STATEMENT SHOWING JURISDICTION OR BASIS OF DETERMINING OF THE STRENGTH OF INSPECTORS.

Railways	Traffic or Transportation Inspectors (Movement)			Block Inspectors				Signal Inspectors				Permanent Way Inspectors			
	Number of stations allotted			Number of Block Instruments & other gears allotted				Number of Lever Units allotted				Length of kilometrage allotted			
	1963-64	1967-68		1963-64	1967-68			1963-64	1967-68			1963-64		1967-68	
	Min	Max	Min	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Central	16	27	16	32	48	32	48	640	1,120	640	1,120	33	117	54	108
Eastern	8	40	8	25	1,940	2,400	4,000	1,400	2,700	2,000	3,300	130	210	96	160
Northern	14	37	10	37	18,268	28,231	24,806	10,291	14,065	11,362	13,935	67	239.34	67	239.34
North Eastern	10	28	10	28	..	..	..	2,000	3,500	2,000	3,500	58.98	151.2	48.4	232.4
Northeast Frontier	15	32	15	35	..	..	..	518	1,203	1,397	3,039	45.08	151.28	37.22	249.54£
Southern	18	45	15	43	73	28	74	384	1,722	362	1,704	44.08	115.06	50.87	184.28@
South Central	91	126	66	115	125*	157*	44*	945*	2,311*	901*	2,365*	199	347	223	338£
South Eastern	18	25	18	23	1,571	2,739	2,044	4,518	1,931	3,827	2,367	4,617	122.5	225.4	100.7
Western	8	32	8	29	..	..	..	180	82,125	428	9,389	*24.43	*141.30	46.71	215.49@

*Figures of South Central Railway do not cover Secunderabad Division.

@Equated track kilometrage.

£Unit not specified.

*Figure in route kilometrage.

ANNEXURE LXXII

STATEMENT SHOWING STAFF HELD RESPONSIBLE FOR CAUSING ACCIDENTS.

Station Railways*	Station Masters		ASMs & Switchmen		Cabin men Levermen and Points- men		Drivers and motormen		Guards		PWs. and APWs		P.W. Mistries, Gangmates Keymen		Train Examiners		Carriage & Wagon Fitters		Total		Percentage of B to 298	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Central	..	5	..	46	4	39	1	104	10	28	1	3	..	4	..	19	1	13	..	261	17	5.7
Eastern	..	4	..	8	..	10	..	69	13	15	..	6	..	8	..	20	1	23	2	163	16	5.4
Northern	..	1	..	52	1	55	..	142	11	34	1	23	3	26	..	42	1	36	1	411	20	6.7
North Eastern	6	..	29	1	54	2	180	33	51	7	8	1	7	..	19	1	19	..	373	45	15.1	
Northeast Frontier	5	3	19	3	32	9	167	34	37	12	6	1	51	..	50	2	52	6	419	70	23.5	
Southern	..	13	2	60	3	38	..	199	26	38	7	37	3	49	2	46	5	29	1	509	49	16.4
South Central	..	..	..	15	1	12	..	124	19	18	3	15	2	10	1	18	3	18	2	230	31	10.4
South Eastern	9	..	..	44	..	24	..	135	2	39	..	25	2	20	..	52	5	27	..	375	9	3.0
Western	..	11	..	49	3	42	..	204	32	39	1	13	1	16	1	40	3	40	..	454	41	13.8
All Railways																						
Percentage- age of 'B'																						
to 298	..	54	5	322	16	306	12	1,324	180	299	34	136	13	191	4	306	22	257	12	3,195	298	100.0
		1.7			5.4		4.0		60.4		11.4		4.4		1.3		7.4		4.0			100.0

A—Total number of staff held responsible for causing accidents.

B—Total number of staff held responsible for causing two or more accidents.

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ANNEXURE LXXIII

STATEMENT SHOWING PERCENTAGE OF VARIOUS CATEGORIES OF STAFF PROVIDED WITH QUARTERS AS ON 31-3-64 AND 31-3-68.

Serial No.	Categories of staff	Central		Eastern		Northern		North Eastern		Northeast Frontier		Southern		South Central		South Eastern		Western	
		As on		As on		As on		As on		As on		As on		As on		As on		As on	
		31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68	31-3-64	31-3-68
1	Station Masters	96.6	99.4	92.8	93.5	89.5	93.4	88.4	89.9	91.2	88.6	95.0	97.7	—	94.6	100.0	88.4	97.7	97.9
2	Assistant Station Masters and Switchmen	60.5	65.4	64.8	64.5	79.7	83.8	68.5	72.9	80.0	68.3	71.2	63.3	—	67.5	72.3	72.2	79.7	81.0
3	Cabinmen, Levermen and Pointmen	57.8	54.5	59.7	52.3	72.4	75.4	64.8	64.6	77.1	69.1	66.0	71.0	—	67.7	62.5	61.2	76.6	80.3
4	Shunting Jamadars, Gunners and other shunting staff	44.6	37.4	51.8	59.6	68.5	73.2	52.4	59.2	80.5	79.2	44.0	53.2	—	70.8	61.0	63.7	57.8	61.9
5	Guards	45.9	48.6	72.4	73.6	58.9	58.2	49.4	52.8	73.0	71.0	59.8	71.8	—	55.4	60.9	63.3	45.2	46.1
6	Drivers and shuntors	50.1	43.6	53.3	87.4	52.3	58.4	45.3	45.3	73.2	76.4	53.9	56.5	—	71.0	72.2	81.7	58.8	61.2
7	Firemen and Assistant Drivers	30.3	31.8	48.2	61.4	54.4	56.8	37.9	38.1	45.8	52.1	37.4	40.7	—	44.7	32.2	49.1	40.3	43.8
8	Motormen	80.0	82.1	62.9	72.0	61.1	77.7	—	—	—	—	73.8	90.5	—	—	—	—	30.8	28.6
9	Train Examiners	29.4	21.9	70.5	69.7	56.2	66.6	73.3	71.7	76.8	70.0	47.1	46.9	—	56.8	74.8	78.4	44.8	51.2
10	Block, Electric, Mechanical Signal Maintainers	53.5	55.8	76.1	63.9	59.1	72.9	44.4	56.8	67.8	63.5	61.3	63.8	—	37.5	62.9	64.9	43.8	62.3
11	Total All Categories	51.2	48.8	57.8	67.0	84.8	68.4	55.9	57.2	71.3	68.6	58.7	61.6	—	62.7	60.5	65.1	63.9	66.6

ANNEXURE LXXIV

AVERAGE NUMBER OF DAYS TAKEN IN FINALISATION OF ACCIDENTS CASES.

Railway	From the date of occurrence to the date of finalisation of accident enquiry				From date of finalisation of accident enquiry to acceptance by competent authority				From the date of acceptance to the date of imposition of final punishment			
	Cases involving disciplinary enquiry		Cases not involving disciplinary enquiry		Cases involving disciplinary enquiry		Cases not involving disciplinary enquiry		Cases involving disciplinary enquiry		Cases not involving disciplinary enquiry	
	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68	1966-67	1967-68
Central ..	24.3	43.2	30.6	37.3	75.5	77.6	79.6	80.9	117.1	127.1	87.9	84.4
Eastern ..	36	36	16	18	No Gap	No Gap	No Gap	No Gap	66	94	43	29
Northern ..	23	18	24	16	25	16	21	25	186	149	38	33
North Eastern ..	14.6	29.1	22.9	2.9	17.3	41.2	38.5	29.1	96.6	60.2	45.7	34.3
Northeast Frontier	8.5	7.5	9.6	15.9	30	23	47.6	34.4	46.7	104	32.7	40.9
Southern ..	25.7	25.4	29.1	22.4	40.8	22.9	29.2	34	116.6	99.2	39.4	30.4
South Central ..	30	24	38	35	34	35	31	33	99	86	50	49
South Eastern ..	16	6	9	8	54	46	49	55	93	120	53	53
Western ..	12.4	11.5	11.1	12.7	19.6	36.8	25.0	52.6	69.6	72.3	..	..

ANNEXURE LXXV

INCIDENCE OF FAILURES OF SIGNALLING AND INTERLOCKING GEARS.

Railways	Number of failures of signal and interlocking gears					Total	Incidence of Signals and interlocking gears per million train kilometres					Total
	1963-64	1964-65	1965-66	1966-67	1967-68		1963-64	1964-65	1965-66	1966-67	1967-68	
Central ..	2,609	3,627	4,760	6,644	7,855	25,495	36.52	50.17	64.89	106.19	151.06	76.88
Eastern ..	8,719	9,186	6,097	4,729	5,131	33,862	168.51	170.93	107.70	83.80	91.36	123.27
Northern ..	1,341	1,121	1,546	1,240	1,033	6,281	19.08	15.66	21.12	17.06	14.39	17.46
North Eastern ..	5,984	5,919	7,473	7,154	7,167	33,677	226.25	208.34	247.86	241.06	248.60	234.80
Northeast Frontier	1,055	1,139	1,273	2,286	2,710	8,463	61.59	59.82	69.02	12.53	145.93	92.42
Southern ..	4,704	4,118	4,097	4,071	2,825	19,815	67.06	59.06	55.81	63.33	52.83	59.86
South Central ..	..	..	..	932	1,640	2,602	..	..	..	45.27	38.11	40.48
South Eastern ..	2,002	2,405	2,507	2,886	4,063	13,863	45.35	53.28	52.35	59.25	78.62	58.35
Western ..	3,620	3,098	4,122	4,461	3,520	18,821	57.10	47.15	62.27	63.82	49.44	55.96
All Railways ..	30,014	30,613	31,875	34,433	35,944	1,62,879	72.41	71.92	72.58	77.60	80.55	75.06

ANNEXURE LXXVI
INCIDENCE OF FAILURES OF BLOCK INSTRUMENTS

Railways	Total number of failures of Block Instruments/Token or Tokenless Block Instruments						Incidence per million train kilometres						
	Block Instruments					Total							
	1963-64	1964-65	1965-66	1966-67	1967-68		1963-64	1964-65	1965-66	1966-67	1967-68	Total	
Central	2,078	2,659	5,052	4,399	3,818	18,006	29.09	36.78	68.88	70.33	73.42	54.30
Eastern	602	545	647	721	717	3,232	11.63	10.14	11.43	12.78	12.77	11.77
Northern	654	595	1,157	1,007	760	4,173	9.30	8.31	15.81	13.85	10.58	11.60
North Eastern	1,993	2,181	1,828	3,000	2,433	11,435	75.61	76.77	60.30	101.08	84.39	79.73
Northeast Frontier	..	658	982	1,013	1,257	1,494	5,404	38.41	51.58	55.03	68.91	80.45	59.00
Southern	3,279	2,996	4,170	2,963	1,965	15,403	47.74	42.97	56.80	46.10	37.31	46.53
South Central	1,333	1,585	2,918	..	..	..	62.73	36.83	45.40
South Eastern	755	859	994	1,018	1,282	4,908	17.10	19.03	20.76	20.90	24.81	20.66
Western	2,238	1,801	1,586	1,455	1,119	8,199	35.30	27.41	23.96	20.52	15.72	24.38
All Railways	12,257	12,618	16,447	17,153	15,203	73,678	29.57	29.64	37.45	38.66	34.03	33.91

ANNEXURE LXXVII
INCIDENCE OF TRACK CIRCUIT FAILURES

Railway	No. of track circuit failures						Remarks
	1963-64	1964-65	1965-66	1966-67	1967-68	Total	
Central	228	300	368	471*	723	2,090	
Eastern	475	467	454	607	578	2,581	*Once incidence took place on 'Unsafe side'.
Northern	362	540	644	896	970	3,412	
North Eastern ..	4	10	15	31	34	94	
Northeast Frontier	40	37	49	306	415	847	
Southern	240	334	409	523	386	1,892	
South Central ..	..	..	..	139	92	231	
South Eastern ..	37	53	62	87	233	472	
Western	170	205	163	338	331	1,207	
All Railways ..	1,556	1,946	2,164	3,398	3,762	12,826	

SHORTFALL IN OVERHAUL AND REPLACEMENT OF LEVER FRAMES AND BLOCK INSTRUMENTS

Railway	Overhauling of inter-locking frames						Replacement of wornout lever frames						Overhauling of Block Instruments/Token Block Instruments						Replacement of wornout Block Instruments/Token Block Instruments					
	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1963-64	1964-65	1965-66	1966-67	1967-68	
Central ..	..	..	..	1	..	..	33	57	45	24	..	22	4	..	..	..	4	..	..	..	..	..	..
Eastern ..	27	40	67	72	78	..	3	10	8	13	10	..	..	..	..	..	..	..	..	..	..	..	..
Northern ..	19	22	22	28	20	..	40	28	15	2	..	13	17	12	4	3	26	28	26	26	26	26	26	
North Eastern ..	105	191	177	102	4	..	16	12	2	..	..	233	301	175	154	120	..	..	..	..	..	..	..
Northeast Frontier ..	..	..	..	..	..	..	..	..	..	..	..	5	4	2	1	..	..	..	..	..	..	..	..
Southern ..	422	607	88	18	18	..	..	..	..	..	1	151	213	70	3	10	..	9	1	1	1	1	25
South Central ..	..	..	..	6	99	..	..	..	..	..	4	..	..	..	21	16	..	..	..	..	..	..	..
South Eastern ..	45	25	6	43	35	..	11	4	7	..	2	14	24	19	1	2	..	..	..	..	..	..	..
Western ..	27	2	4	2	..	..	10	6	10	7	5	..	26	10	34	..	..	..	..	..	..	..	..
All Railways ..	645	947	364	272	254	113	117	87	46	22	438	589	288	218	165	26	37	27	27	27	27	27	51	

ANNEXURE LXXIX INCIDENCE OF FAILURES OF STEAM ENGINES

Railways	1963-64		1964-65		1965-66		1966-67		1967-68		Total number of engine failures
	A	B	A	B	A	B	A	B	A	B	
Broad gauge											
Central ..	306	183,000	297	179,000	290	177,000	279	146,000	175	188,000	1,347
Eastern ..	324	108,982	186	166,215	111	264,428	132	191,238	180	130,642	933
Northern ..	188	258,216	193	244,738	186	256,122	235	194,604	212	205,595	1,014
North Eastern ..	..	..	..	..	..	..	..	..	..	..	..
Northeast Frontier ..	4	197,598	11	156,621	5	420,816	17	1873 01	22	134,873	59
Southern ..	167	171,924	189	105,026	214	129,536	118	189,869	106	155,989	794
South Central ..	..	..	..	..	..	..	83	139,109	118	179,268	201
South Eastern ..	278	1,06,602	219	124,164	158	160,034	180	142,627	13	220,805	948
Western ..	132	195,000	108	244,000	100	288,000	153	182,000	217	127,000	710
	1,399		1,203		1,064		1,197		1,143		6,006
Metre gauge											
Central ..	23	277,000	27	241,000	31	711,000	27	138,000	7	151,000	115
Northern ..	79	167,208	48	281,972	77	186,881	86	163,294	67	204,833	357
North Eastern ..	171	148,217	183	145,765	149	189,051	120	235,548	174	159,044	797
Northeast Frontier ..	82	130,197	59	190,586	50	213,099	51	202,991	61	155,889	308
Southern ..	254	161,964	212	190,419	209	181,523	175	182,396	136	202,448	986
South Central ..	..	..	..	..	..	..	40	175,288	72	220,389	112
Western ..	211	146,000	152	191,000	121	238,000	154	188,000	147	196,000	785
	820		681		637		673		664		3,455

A: Number of Engine failures.

B: Average kilometrage per engine failure.

ANNEXURE LXXX

MAIN CAUSES OF STEAM ENGINE FAILURES ON BROAD GAUGE AND METRE GAUGE RAILWAY-WISE.

Causes	C	E	N	NE	NF	S	SC	SE	W	All Railways
Broad gauge										
Total number of Engine failures ..	1,347	933	1,014	..	59	794	201	948	710	6,006
Main causes										
A. <i>In Shops</i> : Bad Workmanship ..	No. 425 Percentage 31.48	No. 325 Percentage 34.83	No. 417 Percentage 41.12	..	No. 32 Percentage 54.25	No. 348 Percentage 43.83	No. 88 Percentage 43.78	No. 384 Percentage 40.51	No. 246 Percentage 34.65	No. 2,265 Percentage 37.7
Mismanagement of Engine Crew ..	No. 428 Percentage 31.77	No. 263 Percentage 28.2	No. 259 Percentage 25.54	..	No. 17 Percentage 28.81	No. 177 Percentage 22.3	No. 65 Percentage 32.67	No. 334 Percentage 35.23	No. 187 Percentage 26.33	No. 1,730 Percentage 28.8
B. <i>In Shops</i> : Defective material ..	No. 251 Percentage 18.63	No. 203 Percentage 21.75	No. 108 Percentage 10.45	..	No. 7 Percentage 11.86	No. 108 Percentage 13.6	No. 23 Percentage 11.44	No. 76 Percentage 8.02	No. 143 Percentage 20.14	No. 917 Percentage 15.27
Bad workmanship ..	No. 56 Percentage 4.15	No. 120 Percentage 12.86	No. 114 Percentage 11.24	..	No. 3 Percentage 5.08	No. 89 Percentage 11.21	No. 8 Percentage 3.98	No. 54 Percentage 5.7	No. 69 Percentage 9.72	No. 513 Percentage 8.54
Metre gauge										
Total number of Engine failures ..	115	..	357	797	303	986	112	..	785	3,455
Main causes										
A. <i>In shops</i> : Bad workmanship ..	No. 38 Percentage 33.04	..	No. 157 Percentage 43.98	No. 361 Percentage 45.29	No. 158 Percentage 52.14	No. 495 Percentage 50.2	No. 44 Percentage 3.93	..	No. 248 Percentage 31.59	No. 1,501 Percentage 43.4
Mismanagement of Engine Crew ..	No. 20 Percentage 17.4	..	No. 77 Percentage 21.57	No. 233 Percentage 29.2	No. 83 Percentage 27.39	No. 204 Percentage 20.7	No. 15 Percentage 13.4	..	No. 280 Percentage 35.69	No. 912 Percentage 26.4
B. <i>In Shops</i> : Defective material ..	No. 33 Percentage 28.7	..	No. 49 Percentage 13.7	No. 67 Percentage 8.41	No. 36 Percentage 11.88	No. 112 Percentage 11.36	No. 10 Percentage 3.3	..	No. 109 Percentage 13.88	No. 410 Percentage 12.04
Bad workmanship ..	No. 4 Percentage 3.48	..	No. 50 Percentage 14.00	No. 65 Percentage 8.15	No. 17 Percentage 5.61	No. 88 Percentage 9.0	No. 13 Percentage 4.29	..	No. 104 Percentage 13.24	No. 341 Percentage 9.87

NOTE : Percentages relate to the total number of engine failures on same Railway

ANNEXURE LXXXI TIME ALLOWED FOR EXAMINATION OF GOODS TRAINS

Authority prescribing the time limit	At starting station	At examining station en-route	At terminating station
Railway Board	.. 1 hour 15 minutes minimum. (45 minutes for examination and 30 minutes for vacuum and brake adjustment).	Not specified	.. 1/2 minute per wagon for examination excluding time for repairs.
Rule 48 of Conference Rules Part III (Rules for Train Examiners).	2 hours 15 minutes for examination and repairs of interchange trains (going from one railway to other).	Do.	2 hours for examination and repairs of interchange trains.
Central Railway	.. 2 hours 15 minutes for interchange trains and intensive examination and repairs.	45 minutes	.. Not specified.
	1 hour 15 minutes for other trains	.. Not specified	.. Not specified.
Eastern Railway	.. 1 1/2 minutes per wagon for standard of interchange trains with 25 men.	1/2 minute per wagon with ten men.	Not specified.
	1/4 minute per wagon for other trains with 16 men.		
Northern Railway	.. 2 hours 15 minutes for interchange trains with 20 men.	45 minutes for safe to run examination.	2 hours for interchange trains with 20 men. 45 minutes for safe to run examination with 6 men.
	2 hours for intensive examination with 20 men.		
	1 hour for safe to run examination with 6 men.		
North Eastern Railway	1 hour 30 minutes	45 minutes	.. 1 hour 30 minutes.
Northeast Frontier Railway.	2 minutes per wagon for intensive examination	30 minutes for trains intensively examined at originating stations.	3 minutes per wagon for intensive examination. 1 1/2 minutes per wagon for ordinary examination.
	1 minute per wagon for ordinary examination.		

Southern Railway	.. 2 minutes per wagon for intensive examination	The same as that for out-	45 minutes for more than 60 wagons with 6 men.
	1 hour 30 minutes for more than 60 wagons with six men.	going trains.	40 minutes for 45 to 60 wagons with 6 men.
	1 hour 15 minutes for more than 60 wagons with 9 men.		35 minutes for 30 to 45 wagons with 4 men.
	1 hour 20 minutes for 45 to 60 wagons with 6 m. n.		35 minutes for less than 30 wagons with 3 men.
South Central Railway	1 hour 15 minutes for 30 to 45 wagons with 4 men.		35 minutes for more than 60 wagons with 9 men.
	1 hour 30 minutes		
	.. ..	15 to 20 minutes for visual examination and box feeling.	Not specified.
	2 hours 15 minutes for intensive examination	.. ..	Not specified.
South Eastern Railway	.. ..	45 minutes	.. ..
Western	.. ..	45 minutes	45 minutes for ordinary examination.
	1 hour 30 minutes	.. ..	2 hours for intensive examination.

NOTE: For intensive examination and repairs 25 men are utilised on Eastern Railway, 20 men on Northern Railway and only 9 men on the Southern Railway

ANNEXURE LXXXII

INCIDENCE OF HOT BOXES ON COACHING STOCK BG AND MG FOR 10 MILLION KILOMETRES DURING 1960-61 TO 1962-63 AND 1963-64 TO 1967-68.

Railway	Broad Gauge										Metre Gauge							
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68		
Central	2.56	2.56	2.84	1.79	1.57	1.78	1.72	1.90	10.0	14.5	5.30	9.90	5.23	5.96	5.89	2.89
Eastern	0.96	0.7	0.43	0.33	0.40	0.22	0.43	0.41	..	..	..	..	..	..	..	..
Northern	2.2	1.94	11.0	0.92	1.0	0.96	1.16	2.01	9.9	7.0	7.0	3.28	3.28	3.00	3.59	3.61
North Eastern	7.50	5.27	4.32	3.06	3.55	2.37	3.24	9.17
Northeast Frontier	1.55	..	..	..	0.43	..	4.50	5.32	3.42	3.46	3.4	1.75	3.43	4.73
Southern	1.61	1.99	1.17	1.01	1.49	1.69	1.70	1.07	3.29	3.64	3.06	2.55	1.33	2.50	3.49	6.77
South Central	1.4	1.39	..	..	..	..	..	..	7.36	7.78
South Eastern	2.42	1.80	1.56	1.34	1.95	1.40	1.24	0.87	..	..	..	..	..	..	..	..
Western	1.37	0.63	0.87	0.39	0.23	0.33	0.18	0.44	3.0	3.40	3.37	1.77	2.82	2.23	4.27	4.34
ALL RAILWAYS	1.91	1.57	1.63	1.02	1.12	1.09	1.11	1.24	5.74	4.84	3.97	2.94	2.82	2.51	3.92	6.41

ANNEXURE LXXXIII

CAUSE-WISE ANALYSIS OF HOT BOXES ON COACHING STOCK FOR BROAD GAUGE AND METRE
GAUGE RAILWAYS FOR THE YEARS 1963-64 TO 1967-68 SHOWN IN PERCENTAGE.

Causes	Broad gauge					Metre gauge								
	1963- 64	1964- 65	1965- 66	1966- 67	1967- 68	For all years	1963- 64	1964- 65	1965- 66	1966- 67	1967- 68	For all years		
1. Dry packing	22.8	11.4	10.2	7.4	6.5	11.2	20.64	18.83	20.75	17.55	14.5	17.6
2. Insufficient packing	9.1	8.6	6.5	7.7	7.1	7.8	6.39	7.89	6.74	7.73	8.7	7.8
3. Displaced packing	5.1	3.5	2.0	1.3	0.6	2.3	4.91	3.82	4.31	4.37	2.2	3.6
4. Tight packing	0.4	..	..	..	..	0.1	1.23	1.02	..	0.20	..	0.4
5. Extraction of packing	12.2	14.2	20.1	21.2	24.8	18.9	9.33	7.89	7.82	5.40	6.6	7.0
6. Waste between Journal & Brass	13.8	11.1	11.2	7.1	2.9	8.9	14.0	13.48	11.05	8.74	8.6	10.5
7. Badly fitted brass	5.9	17.3	15.3	7.7	10.3	11.4	6.63	7.89	12.13	12.45	13.6	11.3
8. Displaced brass	3.1	1.4	3.1	2.2	2.7	2.5	3.69	3.05	3.50	5.04	4.3	4.1
9. Defective axle guard	0.3	0.3	0.1	0.49	1.02	0.27	0.84	0.3	0.5
10. Defective/inoperative spring	2.1	1.7	0.6	..	0.8	..	0.76	0.54	0.20	0.5	0.4
11. Defective journal	1.0	0.7	1.9	0.6	0.8	1.47	2.80	2.43	4.87	3.7	3.3
12. Other causes such as uneven or overloading roller bearing failures, water or dirt contaminated packing, badly metallised brass & bearing brass deficient etc.	27.6	29.4	29.2	42.6	44.2	35.2	31.22	31.55	30.46	32.61	37.0	33.5

ANNEXURE LXXXIV

INCIDENCE OF HOT BOXES ON GOODS STOCK B.G. & M.G. PER MILLION KILOMETRES DURING 1960-61 TO 1962-63 AND 1963-64 TO 1967-68.

Railway	Broad gauge										Metre gauge									
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1960-61	1961-62	1962-63	1963-64
Central	3.94	4.43	4.26	3.76	11.0	7.63	4.16	3.55	2.56	2.67	5.35	6.41	3.12	3.23	3.61	0.86	..	..
Eastern	7.39	10.3	10.00	9.27	8.53	8.0	6.1	6.25	..	..	..	..	..	..	..	..	..	..
Northern	4.20	5.32	7.0	6.85	4.20	2.94	2.71	2.84	3.1	3.1	2.0	1.92	0.35	0.22	0.46	0.26	..	..
North Eastern	3.22	1.67	1.67	1.55	0.68	0.65	0.64	0.92	..	..
Northeast Frontier	6.25	6.68	3.19	2.59	2.03	1.58	1.15	1.22	0.92	0.79	0.63	0.60	0.64	0.73	..	..
Southern	1.72	2.74	5.45	5.55	3.30	3.60	2.38	2.63	1.42	1.55	4.12	4.64	1.27	2.11	2.21	1.20	..	..
South Central	2.86	2.5	..	..	..	..	..	..	3.29	2.21	..	..
South Eastern	6.08	6.4	9.15	8.71	7.25	5.17	3.58	3.17	..	..	..	..	..	..	..	..	..	..
Western	3.36	4.02	3.98	6.59	5.43	5.01	3.63	3.44	1.82	1.70	2.64	3.67	2.25	2.17	2.25	2.46	..	..
ALL RAILWAYS	5.30	6.3	7.43	6.9	7.3	5.7	3.9	3.7	2.36	1.93	2.85	2.9	1.3	1.4	1.5	1.5	..	..

ANNEXURE LXXXV

CAUSE-WISE ANALYSIS OF HOT BOXES FOR GOODS STOCK ON BROAD GAUGE AND METRE GAUGE SECTIONS FOR THE YEARS 1963-64 TO 1967-68 SHOWN IN PERCENTAGE.

Causes	Broad gauge					Metre gauge				
	1963-64	1964-65	1965-66	1966-67	1967-68	Total	1963-64	1964-65	1965-66	1967-68
1. Dry packing ..	23.7	20.05	18.80	10.94	9.11	17.7	38.43	23.65	22.95	23.64
2. Insufficient packing ..	4.6	5.37	4.89	4.99	4.78	4.9	7.03	7.75	7.79	6.29
3. Displaced packing ..	5.9	4.35	3.89	2.89	2.44	4.1	5.61	4.50	2.70	1.52
4. Tight packing ..	0.9	1.02	0.08	0.05	0.01	0.5	0.99	0.80	0.16	..
5. Extraction of packing ..	2.2	3.28	3.32	2.78	2.59	2.8	5.30	4.79	1.77	2.26
6. Waste between Journal & Brass ..	10.4	8.17	4.67	2.94	2.80	6.4	8.49	9.43	7.9	7.42
7. Badly fitted brass ..	5.3	6.67	8.71	10.18	10.68	7.9	2.81	5.35	8.23	7.87
8. Displaced brass ..	8.1	8.13	10.06	10.41	10.16	9.3	3.06	3.32	4.34	2.99
9. Defective axle guard ..	0.9	1.35	1.87	2.38	2.41	1.7	0.78	0.58	0.93	1.10
10. Defective/Inoperative spring ..	0.3	0.43	0.34	0.78	0.47	0.4	0.43	0.45	0.54	0.5
11. Defective Journal ..	1.4	1.51	1.25	1.79	1.95	1.5	1.90	3.73	4.93	6.35
12. Other causes such as uneven or overloading roller bearing failures, springs broken, water or dirt contaminated packing, badly metallised brass & deficient brass etc. etc.	36.3	39.67	42.12	49.87	52.60	42.8	25.17	35.65	37.95	40.02
										33.2

ANNEXURE LXXXVI

NUMBER AND PERCENTAGE OF OVERAGED COACHING AND
GOODS STOCK ON THE RAILWAYS AS ON 31-3-68

Railways	Coaches			Wagons		
	Holdings	Number overaged	Percentage	Holdings	Number overaged	Percentage
Broad gauge						
Central	2,314	639	27·61	53,562	3,775	7·05
Eastern	3,782	883	23·35	68,349	5,094	7·45
Northern	3,389	936	27·62	59,672	2,996	5·02
North Eastern .. ..	..	..	..	..	..	..
Northeast Frontier	264	11	4·17	34	5	14·70
Southern	2,162	269	12·27	25,655	983	3·83
South Central .. ..	..	..	..	..	..	..
South Eastern	2,448	498	20·34	45,945	2,830	6·16
Western	2,992	519	17·35	35,548	2,762	7·77
Total	17,381	3,755	21·6	2,88,765	18,445	6·40
Metre gauge						
Central .. ..	..	..	..	..	..	..
Northern	1,254	370	29·5	8,897	2,040	22·93
North Eastern	3,487	539	15·46	30,130	4,328	14·30
Northeast Frontier	1,997	283	14·17	12,624	1,578	12·50
Southern	2,645	554	20·9	21,951	3,176	14·50
South Central .. ..	..	..	..	..	..	..
Western	5,604	838	14·95	26,389	2,140	8·10
Total	14,987	2,584	17·2	99,991	13,282	13·30

NOTES :

1. The South Central Railway did not furnish the figures.
2. The Central Railway has stated that they do not own any M.G. stock and their requirements are met by the S.C. Railway.

APPENDIX

**THE RECOMMENDATIONS/OBSERVATIONS OF THE RAILWAY
ACCIDENTS COMMITTEE (1962) AND REMARKS OF THE
RAILWAY BOARD ON THE ACTION TAKEN ON THE RECOM-
MENDATIONS NOT DEALT WITH IN CHAPTERS IV AND V.**

Recommen- dation No.	Recommendation/Observation made by the Railway Accidents Committee (1962)	Board's remarks
		Note : [Remarks within parenthesis of the type] are by R.A.I.C.-1968.
1	2	3

PART I

CHAPTER I

INTRODUCTORY

- | | | |
|-------|--|---|
| 1. | We have decided to take a period of five years from 1st April, 1957 to 31st March, 1962 for our statistical study of accidents on the Indian Government Railways. We have excluded the privately owned narrow gauge lines from the purview of this Report. | This is an observation. The relevant paras contain only factual position. |
| 2(i) | We have divided train accidents into two main categories from the point of view of their effect on safety of trains viz. (a) consequential accidents and (b) indicative accidents. In addition, we have also made a study of technical accidents which involve breach of basic rules of safety without resulting in actual accidents. | This is an observation. The relevant paras contain only factual position. |
| 2(ii) | In view of the fact that consequential accidents, which constitute only 22 per cent of the total train accidents were responsible for 96 per cent of the casualties and 73 per cent of damages caused by all train accidents, we have decided to focus our study on this class of accidents. In doing so, we propose to reinforce and strengthen our conclusions from a study of indicative and technical accidents. In adopting this line of approach, we fall in line with the practices followed on many railways in foreign countries. | The relevant paras contain only factual position. |

CHAPTER II—ACCIDENTS TO PASSENGER TRAINS

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|-------|---|---|
| 3. | Our study of consequential accidents to passenger trains indicates the need for more intensive preventive action on the metre gauge and the narrow gauge. | This is a recommendation which required continuous action. The Railways are paying concerted attention in pursuance of the recommendation. |
| 4(i) | The first objective of the Indian Railways should be to aim at reducing the incidence of collisions on the broad gauge and metre gauge to about 0.14 per million passenger train miles. | The Railways were advised to aim at bringing down the incidence of collisions to 0.14 per million passenger train miles. The Railways are making constant endeavours to achieve this target.
[Also see Chapter II Para 21] |
| 4(ii) | Special educational and admonitory drive among station and shunting staff is required to reduce collisions between trains and shunting engines which form 30 per cent of their total. | Railway Administrations were asked to take necessary action. |

APPENDIX—contd.

1	2	3
4(iii)	The incidence of collisions between trains and trolleys shows an abnormal increase and is 32 per cent of the total. Vigorous action should be taken to reduce them.	The Railways were directed in 1963 to institute a special drive to bring home to the trolley holders the serious risk involved to themselves and to the travelling public in disregarding the safety rules in running and protecting the trolleys on line and to take stern measures against those found not complying with the rules. The inspecting officers were also directed to ensure that trolley holders have knowledge of safety rules and to test the equipment frequently on their inspection. These instructions are being complied by the Railways.
4(iv)	[See Chapter IV, Para 349.]	[See also Chapter II, Para 28].
4(v)	We suggest that trolley refuges should be provided in tunnels and on bridges in accordance with the Schedule of Dimensions, both on main and branch lines, as also at adequate distances in deep cuttings where necessary.	Railways have provided nearly 848 additional trolley refuges on bridges and 42 in tunnels besides as required in cuttings. The balance number of trolley refuges to be provided (82 on bridges and 1 in tunnel) are in various stages of progress/planning. Provision of trolley refuges on some tunnels on Central and Eastern Railways has, however, not been planned due to technical difficulties and high cost. The rules for trolley movement have, however, been modified to ensure safety on such sections.
4(vi)	82 per cent of collisions involving passenger trains were caused by lapses of station staff, drivers and permanent way staff. Prompt action should be taken to reduce their number by instructional propaganda and deterrent punitive action.	The Safety Organisation set up on the Railways is engaged in an intensive safety oriented educational propaganda. The necessity of deterrent action against the staff who cause accidents by their lapses has been impressed upon by the Railways from time to time. The heads of the departments on the Railways are required to keep a personal watch over the adequacy of punishment. Whenever punishments are found on the lenient side the matter is also suitably taken up by the Board with the Railways.
5.	66 per cent of the averted collisions were caused by station staff and 17 per cent by drivers. The basic causes of collisions and averted collisions being identical, similar action as suggested in respect of collisions should be taken to remove the basic causes of averted collisions.	The lapses on the part of the drivers and station staff causing averted collisions are viewed with the same seriousness as in the case of collisions as regards the punitive action.
6.	Our analysis of passenger train derailments show that :	This is an observation only.
(i)	Deraillments per million passenger train miles on metre gauge and narrow gauge have been 3 and 16 times the corresponding figures on broad gauge.	This is an observation only. [See also Chapter II, Para 47].
(ii)	Lapses of railway staff were responsible for 27 per cent of derailments.	This is an observation only. [See also Chapter II, Para 56].
6(iii)	Contribution of track defects and engine and rolling stock defects to derailments of passenger trains was on the high side. This indicates unsatisfactory maintenance and emphasises the need for better maintenance. Metre gauge and narrow gauge need more attention in this respect.	The standardised maintenance schedules have been introduced on all Railways and rolling stock maintenance is receiving adequate emphasis on all Railways. [See also Chapter II, Paras 57—64].

APPENDIX—contd.

1	2	3
6(ii)	Officers holding departmental enquiries should endeavour to arrive at precise findings in all cases.	Railways were advised to impress upon all officers that they should always endeavour arrive at precise findings. Where, however a combination of factors is inevitably held to be responsible for an accident they should attempt to quantise the relative contribution of each of the factors to the extent possible. The Railways are complying with the instructions to the extent possible. [See also Chapter II, Para 77]
7(i)	The number of level crossing accidents is generally on the increase.	This item gives only the actual position. Efforts are being made to minimise the incidence of level crossing accidents by implementing the recommendations made by the [Kunzru] Committee in this regard. The number of accidents both at manned and unmanned level crossings has come down from 168 in 1962-63 to 104 in 1966-67. [See also Chapter II, Paras 88-89].
7(ii)	Our analysis of the causes of accidents at manned and unmanned level crossings indicates that manning of level crossings is not the complete remedy against their occurrence.	Instructions were issued to the Railways in 1963 to ensure stricter supervisions in the work of gate-keepers and test of knowledge of safety rules. Orders were also issued for taking periodical census of level crossings including cattle crossings once in every 5 years and taking appropriate action for manning/upgrading in consultation with the state Governments after obtaining their acceptance as per extant rules. The Railways have been asked to vigorously pursue with the State Governments regarding the work of manning and provisions of bumps on the approaches of the unmanned level crossings. Instructions are being complied by the Railways.
7(iii)	88 per cent of accidents at manned level crossings were due to failure of gatemen indicating that either the gatemen are careless or their number is inadequate.	[See also Chapter IV, Para 403].
7(iv)	We suggest that additional gatemen should be provided where necessary, based on a yardstick to be laid down by the Railway administrations after investigations.	The Railways have been advised that while deciding manning/upgrading including posting of additional gatemen, they should take into consideration local conditions, pattern and quantum of both road and rail traffic as well as the need for economy.
7(v)	[See Chapter IV, Para 408.]	[See also Chapter IV, Para 403]
7(vi)	[See Chapter IV, Para 403.]	
7(vii)	Cattle crossings should be reviewed and converted to 'C' class level crossings where justified.	This is in accordance with the present policy. The attention of the Railways has been drawn to the [Kunzru] Committee's recommendation. On South Eastern and the South Central Railways, the review has been completed. No upgrading of 'D' class level crossings was found necessary. In certain areas in Rajasthan, cattle crossings are now being upgraded into 'C' class level crossings in consultation with the State Government. Review on other Railways is in progress.
7(viii)	We find that 77 per cent of the total number of accidents at all level crossings were caused by failure of road users.	Railways have provided road signs (stop boards) at the approaches to all unmanned level crossings. Regarding provision of bumps, matter is still under correspondence with the Ministry of Transport who have not communicated their decision in the matter. Some bumps have, however, been provided in Andhra Pradesh and Mysore. [See also Chapter IV, Para 403]

APPENDIX—*contd.*

1	2	3
8(i)	We request investigations into the electrical defects which caused the largest number of fires in passenger trains.	In regard to the technical investigation, the causes of electrical fire cases which took place from 1957-58 to 1961-62 were analysed. It was noticed that 49 per cent of the fire cases occurred due to lackness in maintenance and about 35 percent of the cases were due to defects caused by tampering of equipment by miscreants. Accordingly, the Railway Board issued instructions in November, 1963 to tighten up the maintenance and security arrangements. A detailed investigation into the causes of fires was also carried out by R.D.S.O. to minimise the risk of electrical fires and they have issued a code of practice for train lighting maintenance in regard to the prevention of fires.
		A new Act, viz., Railway Property (Unlawful Possession) Act, 1968 was also passed and came into force with effect from 1-4-1968. It is felt that the operation of this Act will go a long way in bringing down the incidence of thefts of electrical fittings.
9(ii)	Railways should intensify their propaganda for warning passengers and railway staff of the fire hazards.	Railways were advised that propaganda campaign which they have already undertaken should be intensified for warning the passengers and the railway staff about fire hazards. They were also asked to carry out the propaganda through other media like display of advertisements, cinema slides etc. The Railways are taking action accordingly.
9(i)	Serious note should be taken of cases of breach of basic rules of safety, 90 per cent of which were committed by station staff and drivers.	Serious note is taken of the cases of basic rules of safety, and deterrent punitive action is taken. Instructions have also been issued that apart from the punitive action, drivers and station staff who are held responsible for violation of basic rules of safety should be singled out for corrective action and a special watch should be kept over their subsequent working.
9(ii)	Drivers were responsible for 85 per cent, while station staff and others were responsible for 15 per cent of the cases of trains passing signal at danger. Cases of disregard of more than one signal at a time were also appreciable. These clearly establish the need of a personalised and mass propaganda amongst these staff with a view to make them vigilant and alert in the observance of signals.	Railways were advised to take action on the basis suggested by the Railway Accidents Committee (1952). Railways are taking action accordingly. [See also Chapter IV, Para 303.]
9(iii)	We suggest that a driver must operate a minimum number of three trips for learning the road. A driver who has not operated on a section for six months should again learn the road before working on the section.	Instructions that a driver must operate a minimum number of three trips for learning the road and a driver who has not operated on a section for six months should again learn the road before working on the section have been issued to the Railways. On hill and ghat section or any other Section requiring special attention, a driver is required to make additional trips as may be prescribed having regard to the needs of each case.

APPENDIX—*contd.*

1	2	3
10(i)	We have made a detailed study of the 74 cases of serious accidents into which statutory enquiries were held by the Government Inspectors of Railways/Additional Commissioners of Railway Safety. While the number of these accidents constituted only 3 per cent of the total number of consequential passenger train accidents, they resulted in 92 per cent of deaths, 88 per cent of injuries and 68·5 per cent of damages caused by all of them.	This is merely an observation containing the factual position which did not require any action. [See also Chapter III, Para 180.]
10(ii)	Accidents caused by the lapses of drivers, station staff and gatemen and road users and by miscreants tampering with track were responsible for 87 per cent of fatalities, 92 per cent of injuries and 90 per cent of damages resulting from all the 74 serious accidents.	This is an observation and did not require any action. [See also Chapter III, Para 183.]
11	The increase in accidents due to human failure, as compared with the previous quinquennium, is disquieting. The number of failures of locomotives, rolling stock and permanent way and fires in trains have, however, shown a decline.	With a view to check human failures, safety organisation was set up on all the Railways and in the Board's Office in accordance with the recommendations of the [Kunzru] Committee and safety propaganda was undertaken on the lines suggested by the [Kunzru] Committee. As a result thereof the number of accidents attributable to the failure of railway staff have come down steadily from 1016 in 1962-63 to 679 in 1966-67.
12(i)	Acquittals of staff held responsible for accidents, do not substantially alter the position of the overall staff responsibility.	This is an observation and did not require any action.
12(ii)	[See Chapter IV, Para 328.]	
CHAPTER III—GHATSILA, MAINPURI AND KOSGI ACCIDENTS		
<i>Ghatsila Accident</i>		
13(i)	We agree with the Additional Commissioner of Railway Safety and the Commissioner of Railway Safety that the Ghatsila accident was the result of tampering with track by some unknown persons.	This is an observation.
13(ii)	We agree with the Commissioner of Railway Safety that the defects in the engine did not contribute, in any manner, to the accident, as suggested by the Additional Commissioner of Railway Safety, Bombay.	This is an observation.
14(i)	We invite the special attention of the Railway administrations to the importance of insisting upon daily methodical work of the permanent way gangs and its proper check and supervision.	Instructions were issued to the Railways in January, 1963 to ask the supervisory staff to set definite and regular task to the gangs and to check in detail the work of the gangs on their regular inspections. This is being followed by the Railways.
14(ii)	We suggest that, as far as possible, newly trained or promoted permanent way staff and inspectors should be placed under experienced hands for personal supervision and guidance.	Instructions were issued in January, 1963 that as far as possible newly trained or promoted permanent way staff and inspectors should be placed under experienced hands for personal supervision and guidance. This policy is being implemented by Railways.
15	Our study discloses that the circumstances and factors existing before the Fadali accident on Central Railway in 1957, are similar to those existing before the Ghatsila accident.	This is an observation.
16	[See Chapter III, Para 183 and Chapter IV, Para 560.]	

APPENDIX—contd.

1	2	3
17	[See Chapter IV, Para 560.]	
18(i)	[See Chapter IV, Para 560.]	
18(ii)	[See Chapter IV, Para 365.]	
19	[See Chapter IV, Para 560.]	
20(i)	[See Chapter IV, Para 560.]	
20(ii)	[See Chapter IV, Para 560.]	
20(iii)	[See Chapter IV, Para 560.]	
21	[See Chapter IV, Para 560.]	
22	[See Chapter IV, Para 560.]	
<i>Mainpuri Accident</i>		
23	We accept the findings of the Additional Commissioner of Railway Safety that the Mainpuri accident was caused by the train running at excessive speed.	This is an observation.
24	[See Chapter IV, Para 354.]	
25(i)	We find that the conclusions as to the conditions of the track on the Shikohabad-Farrukhabad section, arrived at as a result of the oscillation trials recently conducted by the Railway Board, are similar to those already arrived at by us.	This is an observation.
25(ii)	We suggest oscillation trials with GWD/AWD or other engines prone to lateral oscillations on sections with sub-standard track for experimental verification of safe speeds.	Instructions were issued to the Railways accordingly in June, 1963. These are being followed.
26	Until track renewals are completed on the Shikohabad-Farrukhabad Branch, we recommend effective supervision and augmentation of gang strength, where found necessary, to ensure proper maintenance.	Instructions were accordingly issued in Jan. 1963. Out of 108·52 kms. length of Shikohabad-Farrukhabad section, length up to 69·86 kms. has been renewed. The renewal of the balance 38·67 kms. has already been programmed in the current year's (1963-1969) Works Programme.
27	Track defects of the types found in the Mainpuri case should be taken into account in considering priorities for track renewal programmes and for determining the strength of maintenance staff.	Instructions were issued in Jan., 1963 to the Railways for according priority for track renewal in such cases and for augmenting gang strength where necessary for satisfactory maintenance of track.
28(i)	[See Chapter IV, Para 354.]	
28(ii)	In order to emphasise the importance of strict observance of the speed limits of different sections, which is so vital to the safety of trains, we suggest that the drivers, before commencing their trips should be specially briefed about the speed restrictions to be observed.	All permanent speed restrictions are notified in the Working Time Table, a copy of which is supplied to all drivers. Instructions have been issued to the Railways that temporary speed restrictions imposed from time to time should be posted sectionwise in a separate register. The restrictions imposed should be brought forward in the Restriction Register at the end of each week and arranged in geographical order of location and given fresh serial numbers. Instructions have also been issued that the acknowledgement by the driver for the temporary speed restrictions imposed on a particular section should be obtained each time he is booked to work a train on that section. The Railways are following these instructions.
<i>Kosgi Accident</i>		
29	We agree with the finding of the Additional Commissioner of Railway Safety that the Kosgi accident was caused by the driver of 14 Down passing the main starter signal of the station at danger.	This is an observation and did not require any action.

APPENDIX—contd.

1	2	3
30.	This accident points to the necessity of: (i) frequent independent checks of speed violations by drivers, on lines with restricted speeds;	Railways were asked to check speed recorder charts systematically. It has also been suggested that additional sheets should be provided against each driver's record, wherein the result of checking should be indicated. All Railways have confirmed that frequent independent checks of speed violations by drivers are being done.
	(ii) Surprise tests of observance of signals by devising conflicting signals etc.;	Recommendation not accepted. A procedure whereby conflicting signals are devised on purpose with the object of testing drivers in their alertness will involve interference with interlocking gear at interlocked stations which will not be in the larger interest of efficiency and safety of operation. Even at the non-interlocked stations, such a test may not serve any useful purpose.
	(iii) Special action to instil in drivers the over-riding necessity of observance of speed restrictions by particular types of engines, on sections with varying working speeds.	The maximum permissible speeds for different types of locomotives for different sections are already laid down in the working time tables, copies of which are given to all drivers. Special attention of the drivers is also drawn to this feature through loco inspectors and refresher courses at the Training Centres.
31.	We agree that the sand hump taking off main lines would not produce unsafe conditions, with the Additional safeguards suggested by Additional Commissioner of Railway Safety, Bangalore.	This is an observation, and does not require any action.
32. (i)	We hold the view that serious accidents are often preceded by some indications of their occurrence. In support of this view, we cite the instances of repeated speed violations on Shikohabad-Farrukhabad Section and the track defects found in the course of investigations into Ghateila and Mainpuri accidents.	This is an observation. As far as violations of speed restrictions are concerned, General & Subsidiary Rules of the Railways require the railway officials to report such violations to proper authorities.
32. (ii) (a) to [See Chapter IV Para 354]		
(d)		
33.	We suggest an improved procedure for dealing with reports of enquiries into accidents held by the Additional Commissioners of Railway Safety so that the knowledge and experience of the officers concerned are brought to bear on all the aspects of the reports.	Railways were advised that the ACRSs have been instructed to send 7 copies of their Draft Report and one copy of the evidence to both the Railway Board's office as well as the Railway administration concerned. As soon as copies of the report are received, arrangements should be made to distribute these reports to the various Heads of Departments for getting their views on the reports as a whole. Similarly copies of the report and also CRS's notings are also distributed amongst the Directors in the Board's Office for making a critical study of the report as a whole giving comments even on those issues with which they may not be directly concerned.
34.	Delays in the implementation of the recommendations made by the Additional Commissioners of Railway Safety in their reports of enquiries have been brought to our notice. We suggest better scrutiny of the progress and pursuance of their recommendations.	A constant watch is being kept both on the Railways as well as in the Board's office on the implementation of the accepted recommendations made by the Additional Commissioners of Railway Safety in their reports of enquiries.

APPENDIX—contd.

1	2	3
35.	We suggest that brief reports of statutory enquiries into accidents be published in the manner of the Inter state Commerce Commission Reports of the United States of America.	The Ministry of Law to whom the matter was referred for advice, had expressed themselves against publication of the report since such a course, in the event of prosecutions having been launched or likely to be launched against the staff involved in accidents, might result in public discussion of matters likely to be adjudicated by the courts thus prejudicing a fair trial of the accused. In view thereof, this recommendation was not accepted. [See also Chapter IV Para 339].
36.	[See Chapter IV Para 308.]	
37.	[See Chapter IV Para 212]	
38.	[See Chapter IV Para 212]	
39.	We recommend supply of handy rule books separately for each category of staff. These should contain information of the type we have briefly outlined and should be written in simple language and attractively printed.	The following handbooks have been printed in English and other regional languages and distributed to the concerned staff:— (i) Handbook for SMs/ASMs. (ii) Handbook for Guards. (iii) Handbook for Gatemen. (iv) Handbook for Yard Staff. (v) Handbook for Switchmen and Cabinmen. (vi) Handbook for Pointmen and Levermen. (vii) Handbook for Permanent Way Staff.
40.	[See Chapter IV Para 303.]	
41.	We recommend the launching of a mass campaign and propaganda from a central focal point on each Railway, conducted chiefly through posters placards, pamphlets and films. We also suggest the lines on which this should be conducted.	Mass campaign and propaganda on the lines as recommended by the [Kunzru] Committee was launched by the Safety Organisation of the Railways and it is continuing with all vigour.
42.	[See Chapter IV Para 263]	
43. (i)	[See Chapter IV Para 222]	
43. (ii)	[See Chapter IV Para 249.]	
44.	[See Chapter IV Para 222.]	
45.	Failure of staff which are responsible for a large number of accidents can be considerably reduced if the Railway administrations create those psychological conditions in which staff themselves willingly abide by the safety rules and regulations. This should not require a revision of the current disciplinary procedure.	The Safety Organisations created on the Railways are engaged in creating these conditions through their personalised contacts during which the importance of rules and regulations and consequences to themselves to the Railway and its users of not following them, are impressed upon them.
46.	[See Chapter IV Para 290.]	
47.	[See Chapter IV Para 280.]	
48.	We recommend, for the sons of railway employees, opening of polytechnics and schools for training as Signallers at a Central place on each Railway Zone.	On account of difficulty in giving preference to children of railway employees in the up of such matter of recruitment, the setting schools and polytechnics will not help. There are already vocational training centres on the railways for imparting vocational training to children of railway employees and such training schools should continue to be developed on the Railways.
49.	[See Chapter IV Para 322.]	
50.	The Divisional Organisation is the implementing agency of the policy of the Railway administration and the Railway Board. The Divisional Superintendent is the linchpin of the Divisional machinery. We suggest launching of programmes on the lines of those outlined in Annexure 'F', so as to infuse the Divisional Organisation with the required dynamism.	The Railways were instructed to bear in mind the points brought out in the recommendation and take necessary steps to raise the morale of staff by instilling in them pride of work and a sense of duty and by ensuring that staff grievances are attended to promptly.

APPENDIX—contd.

1	2	3
51.	On a rough assessment we find that the work load varies considerably on various Divisions. We recommend that the Railway Board undertake an examination of the workload on the Divisions so as to evolve a norm and then, on its basis, strengthen or bifurcate the Divisions, as may be justified.	<p>Certain criteria for determining the work load on the Divisions have been established based on past experience and are utilised for a very general appreciation of the workload devolving on the Divisions. These criteria are naturally different for a terminating Division like Bombay (Western Railway) and for a passing-through Division like Lucknow Division (Northern Railway).</p> <p>The examination of workload on Divisions and the relief to be provided therefore are a continuous process and receive constant action of each Railway administration and the Railway Board. Generally, bifurcation of a Division is adopted as a last resort as it is organisationally costly and very often it is not operationally practical to bifurcate the division unless there are independently manageable and distinct streams of traffic.</p>
CHAPTER—V SAFETY AIDS		
52.	While we hold the view that the safety of the Railways depends ultimately on human vigilance, we consider that staff should be provided with some simple safety aids.	Though the recommendation suggests no specific action, yet safety aids as recommended by the (Kunzru) Committee in the various recommendations are being provided progressively commensurate with the availability of ways and means.
53. (i)	[See Chapter IV Para 486.]	
53. (ii)	[See Chapter IV Para 486.]	
54.	We consider that joint inspection of signals by the Signal, Traffic and Loco Inspectors should be made mandatory and recommend the introduction of a Subsidiary Rule to this effect.	Instructions were issued to the Railways in March, 1963 that periodical inspections of the signals should be carried out jointly by the Signal, Traffic and Loco Inspectors at an interval of every quarter. The Railways have also been directed to make necessary provision in their Operating Manuals. Signal Engineering Manual has also been suitably amended.
55. (i)	[See Chapter IV Para 478.]	
55. (ii)	Where the first stop signal is not visible the position, location and height of the signal posts should be altered; or alternatively, Repeaters should be provided.	The Railways were instructed to ensure adequate visibility of the first stop signal by re-erecting or repositioning of the signal or to provide repeater/repeaters at suitable locations.
55. (iii)	In case other expedients cannot be provided for obtaining adequate visibility, permanent speed restrictions should be imposed for trains approaching first stop signals.	The Railways have been advised to impose permanent speed restriction in such cases.
55. (iv)	[See Chapter IV Para 444.]	
55. (v) (a)	We find that the provision of sighting boards has not been completed on all the trunk routes. We consider that this should be completed within 6 months on all the main line sections where the maximum permissible speed is more than 45 miles per hour on the broad gauge and 30 miles per hour on the metre gauge. This should be extended to all sections where the maximum speed is more than 30 miles per hour and where visibility is poor.	Instructions to the Railways already existed, that the sighting boards should be provided at a distance of 3,170 ft. in rear of the Outer/Warner signals on sections where the maximum permissible speed was 60 m.p.h. Instructions were re-emphasised in Feb., 1963 that provision of sighting boards at a minimum distance of 3,170 ft. in rear of the Outer/Warner signal should be extended to all stations, where the maximum permissible speed on the section is more than 45 miles per hour on the broad gauge and more than 30 m.p.h. on the metre gauge.

APPENDIX—*contd.*

1	2	3
55 (v)(b)	We also suggest the provision of a strip of white mark across the track to mark the location of the sighting board.	The Railways were advised that a strip of white mark about 4'—0" wide should be provided on the ground across the track opposite to the site where the sighting board has been installed. This work has since been completed on all the Railways.
56	We suggest the use of Lever Collars on the lever handles at all interlocked stations to serve as a visual warning to staff operating the levers. This work should be completed within three months.	Instructions to the Railways already existed about the use of lever collar and about the introduction of a suitable rule on the use of the lever collars to be incorporated in the subsidiary rules of the Railway. Instructions were, however, re-emphasised on the Railways in Feb., 1963. [See also Chapter II, Paras 27 and 30.]
57(i)	We suggest that the road authorities should provide road signs and signals at approaches to all level crossings. The road signs should be standardised on an all-India basis.	These recommendations were brought to the notice of the State Chief Secretaries de-mofficially in Dec., 1962 for necessary compliance and to the Secretary, Ministry of Transport and Communications in Jan., 1963 for similar action in respect of National Highways. The instructions were also issued to all Railways to put up prominent road signs with the words 'STOP' in regional languages. Railways have provided road signs 'STOP' Boards at the approaches to unmanned level crossings.
57(ii)	[See Chapter IV, Para 413.]	
57(iii)	[See Chapter IV, Para 415.]	
58	We stress the need of speedy action to ensure that a third luggage-brake or an anti-telescopic-steel-bodied or steel coach is put on in the front and the rear of all passenger trains.	The recommendation made by the Railway Accidents Committee 1962 to ensure that a third luggage-brake or an anti-telescopic-steel-bodied coach is put on in the front and the rear of all passenger trains has been implemented. All passenger trains run with a third-cum-luggage-cum-brake or a luggage-cum-brake (TLR/LR) in the front and the rear except on a few short distance restricted speed shuttles, under special dispensation.
CHAPTER VI—METHODS AND MACHINERY FOR IMPLEMENTATION		
59(i) to (iii)	[See Chapter IV, Para 341.]	
60	[See Chapter IV, Para 341.]	
61	We consider that accidents need not inevitably increase with the increase in volume of traffic.	This is only an observation requiring no specific action. Despite increase in the volume of traffic the accidents on the Railways have been showing continuously declining tendency.
62	We mention that the failure of railwaymen and the accidents resulting from them are insignificant as against their achievements in the context of the vastness of the field of their operation.	This is only an observation and did not call for any specific action.

APPENDIX—contd.

1	2	3
63	We suggest that the Railway administrations should welcome and make use of the offer of co-operation of the railway union in the matter of safety propaganda.	It has already been the policy to enlist Co-operation of organised labour. However, the recommendation has been brought to the notice of the Railways for their guidance and appropriate action. Railways have also taken steps in various ways to secure the co-operation of labour.
64	The responsibility for improving the safety record of the Indian Railways rests squarely and for ever on the Railway administration. In doing so, no consideration of cost should come in the way, as accidents are cumulatively very costly and are a source of avoidable waste of money, material and energy.	All measures which are considered necessary for improving the safety of train operation are accepted and implemented within the limitations of railway resources.
65	We consider that the implementation of our proposals at this critical juncture will help the Railways to equip themselves for rendering a more secure and safe service to the nation.	This is only an observation and did not call for any specific action.

PART II

CHAPTER II—STATISTICAL ANALYSIS OF ACCIDENTS—GAUGE-WISE

1	We find that the yearly figures of important accidents, involving both passenger and goods trains, during the period of six years from 1957-58 to 1962-63, are not comparable, because of the unilateral change in the definition of fires in trains, made in 1961-62, by the Central and North Eastern Railways, which we deprecate. Excluding the cases of fires in trains, the total accidents on all Railways have been higher than in 1957-58.	The Railways were advised in February, 1964 that the need for adhering to the definitions as laid down in the Manual of Statistical Instructions for compiling of statistics of accidents should be emphasised on all concerned. In case of any doubt or when a Railway feels the need for any change, Railway Board's prior approval should be obtained by the Railways.
2	The incidence of important accidents during the last six years has shown a decrease on the broad gauge and an increase on the metro gauge, where it has been throughout higher than on the former. Further, the disparity between the two has been widening and deserves the special notice of the Railway authorities.	A close watch is kept on the incidence of accidents on all the gauges both on railways as also in the Railway Board's office and suitable steps taken whenever the situation so demands.
3	Our study of accidents does not support the impression that the increase in traffic mainly accounts for the increase in accidents.	This is merely an observation.
4	We find a wide range of variation in the incidence of accidents per million train miles on the different railways, and in different years on the same railway, which signifies the possibility of effecting marked improvements in reaching the best performances if the Railway administrations undertake an objective analysis of accidents and carefully select and effectively implement the preventive measures.	The Railways have been constantly making objective analysis of accidents and taking necessary remedial action. The suggestion of the [Kunzru] Committee in regard to fixation of targets based on the Railway's best performance, has been dealt with under para 27 of the [Kunzru] Committee's report.

Collisions

5(i)	The incidence of collisions is about 50 per cent more on the broad gauge than on the metro gauge, the incidence on the B.G. and the M.G. has been highest on the Eastern and the North Eastern Railways, and lowest on the Western and Southern Railways, respectively.	The incidence of collisions per million train kilometres on the Eastern and North Eastern Railways has been controlled since 1964-65.
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APPENDIX—*contd.*

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5(ii)	Collisions between trains and shunting engines, which constituted the largest proportion of collisions, have been showing a downward trend on the broad gauge. We suggest that the measures which have resulted in improvement on the broad gauge should be applied also to the metre gauge where there has been a deterioration. We suggest the need for special attention to collisions between two trains, whose proportion has been increasing on both the gauges.	A study on collisions was made for the year 1963-64. This study was circulated to all the Railways for their guidance to enable them to take necessary action. The number of collisions has been showing a declining trend in that their number came down from 98 in the year 1962-63, to 66 in 1967-68. [Also see Chapter II, Paragraph 10. The figures given there were furnished to the Committee by the Railways.]
5(iii)	Thirty-four and forty-two per cent of the collisions, on the broad gauge and metre gauge respectively, were caused by the reception of trains on blocked lines or by despatching them into blocked sections or by the incorrect setting of points. In addition, drivers were responsible for 21 and 17 per cent of the collisions on the two gauges respectively. We emphasise the need for imparting training and a personalised approach to the station staff and drivers and to provide them with appropriate signalling aids.	With a view to preventing reception of trains on occupied lines, instructions were issued to the Railways to undertake the provision of track circuiting on a programmed basis.
5(iv)	Collisions between trains and trolleys are more on the broad gauge than on the metre gauge and are susceptible of appreciable reduction for which the Railways should enforce strictly the rules for trolley protection.	Basic safety essentials which should be observed for running of trolleys, motor trolleys, and lorries were compiled in Board's office and sent to the railways for incorporation in their subsidiary rules. The Railways have already taken action in this regard. [See also Chapter IV, Paragraph 349.]
		<i>Derailments</i>
6(i)	The incidence of derailments per million train miles on the broad gauge has been throughout lower than on the metre gauge. This shows that by raising the standard of equipment and its maintenance and by inculcating greater alertness amongst the operating staff, it is possible to neutralise the adverse effects of the higher intensity of traffic.	Instructions were issued to the railways desiring that steps should continue to reduce further the incidence of derailments on the metre gauge with a view to bring it down to the level on the broad gauge. The incidence of derailments has come down on the broad gauge as also on the metre gauge since 1963-64, though there was a marginal increase on the broad gauge on 1967-68. [See also Chapter II, Paragraph 47.]
6(ii)	Seventeen per cent of the derailments on the broad gauge and 36 per cent of those on the metre gauge occurred in midsection; such derailments, being more dangerous, call for special steps to reduce their occurrence.	The Efficiency Bureau in the Board's office have already made a study of midsection derailments on the Central Railway. Action in the light of the recommendations made in the said report is being taken on the railways. The Efficiency Bureau have also completed their report in regard to midsection derailments on Southern Railway and have also taken in hand a similar study in respect of the Northeast Frontier Railway. Necessary action will be taken in the light of the recommendations made by Efficiency Bureau.
6(iii) (a)	Fifty two per cent of the station derailments and 11 per cent of midsection derailments on the broad gauge were caused by various types of failure on the part of the staff. The corresponding figures for the metre gauge were 46 and 19 per cent respectively.	This is only an observation and did not require any specific action.

APPENDIX—contd.

1	2	3
6(iii) (b)	61 per cent of the station derailments caused by failures of station staff on the broad gauge and 53 per cent of those on the metre gauge were attributed to incorrect setting and non-locking of points. We, therefore, suggest that the guard should personally supervise shunting at all stations except where a Shunting Jamadar or a corresponding official is in charge of shunting. In all cases of shunting whether involving a passenger or a goods train, locking of facing points should be made compulsory.	Instructions were issued to the railways on the lines suggested by the Committee. The railways were further advised that besides ensuring the locking of facing points during shunting operations on a passenger train or a part thereof or an entire goods train they should insist on facing points being locked during shunting operations on a train or part of a train at all interlocked stations where interlocking so permits and further that locking of facing points should be a pre-requisite for shunting on all trains at all non-interlocked stations also.
6(iii) (c)	Thirty four per cent of the station derailments on the broad gauge and 36 per cent on the metre gauge were caused by the failures of drivers; the midsection derailments attributed to them were 53 per cent and 62 per cent on the two gauges, respectively. As inadequate brake power may be a contributory factor, we suggest an expeditious conclusion of the experiments undertaken by the Research, Designs and Standard Organisation (RDSO) so that more powerful and effective brakes may be provided on trains.	The Research, Designs and Standards Organisation was addressed for taking action to implement the decision expeditiously. A number of improvements in vacuum brakes suggested as a result of Research Designs and Standards Organisation's detailed research has been incorporated in the new stock, with the result that brake power available on stock of new design is higher than that provided on the old stock. In order to improve the total brake power available on goods trains the percentage of effective brake cylinders has been increased from 75 per cent to 85 per cent on broad gauge. All Railways are now working to this revised percentage.
[See also Chapter IV, Paragraph 478.]		
6(iv)	Defective loading was responsible for 35 per cent of midsection derailments caused by failures of the staff on the broad gauge and 36 per cent. on the metre gauge. We suggest that the Railways should make a detailed study of the nature of such defective loading and devise measures to avoid them.	After a study of derailments due to uneven loading had been undertaken, the Research, Designs and Standards Organisation was addressed to go into the question of evolving suitable, simple and inexpensive measures for the loading, securing and packing of consignments which according to the study were susceptible to uneven loading and/or shifting on run. The matter is engaging the attention of the Research, Designs and Standards Organisation.
6(v)	On the metre gauge, track defects caused a larger number of derailments at stations than between stations. The position was reverse on the broad gauge. The wide variations on the different Railways in the accidents caused by track defects point to the need for raising the standard of the track and its maintenance on the Railways, where the performance is poor.	The Railway Accidents Committee's recommendation and Board's views thereon were communicated to the Railways. Railways were also asked to programme track renewals over sections having track materials below the present standards and to intensify the maintenance on such sections till renewals are carried out. The recommendations of general applicability in the study of derailments on metre gauge carried out by the Efficiency Bureau have been forwarded to the Railways who have since implemented these recommendations.
6(vi)	Sixteen per cent. of the derailments on the broad gauge and 20 per cent. on the metre gauge were caused by carriage and wagon defects, whose incidence varies considerably on the different Railways. The incidence of these derailments per hundred million vehicle miles on the metre gauge is 232 per cent higher than on the broad gauge. This emphasises the urgent need for improvement on the metre gauge of some Railways.	The Railways were asked to pay special attention to the repair and maintenance aspect, keeping in view the observations of the Kunzru Committee, and ensure that the rolling stock is always maintained in good fettle. The Railways have taken action accordingly.
[See also Chapter II, Paras 58 and 61.]		

APPENDIX—*contd.*

1	2	3
6(vii)	Four per cent of the derailments on each of the two gauges were caused by engine defects and we urge that the maintenance of engines on the Railways with a bad performance should be improved appreciably.	Same remarks as against item No. 6(vi).
6(viii)	In a number of cases, responsibility for derailments was not clearly established and heavy delays occurred in finalising the cases. We suggest that the Railway Board and the Commission of Railway Safety should pay special attention to this problem so that preventive action may not be delayed.	Railways have been directed that every effort should be made to fix correct responsibility in cases of derailments particularly those occurring in midsection. Where the responsibility could not be fixed at lower levels, it was the duty of senior officers to look into the cases and fix responsibility. A constant watch is kept in Board's office over the finalisation of accident cases through monthly returns.

[See also Chapter II, Para 77].

Accidents at Level Crossings

(i)(a)	The level crossing accidents have been showing an upward trend on both the gauges but more so on the metre gauge. Ninety per cent. of the accidents at manned level crossings on the metre gauge and 77 per cent. on the board gauge were attributed to the failure of the railway staff and this indicates the need for greater vigilance on the part of the gatemen. We suggest that the Permanent Way, Loco and the Transportation Inspectors should watch and report on the alertness of the gatemen and officers should make frequent checks on the working of the gatemen and the security factors at the gates. Severe action should be taken against those found not alert or absent from duty at the time of the passage of trains.	All the Railways were instructed to take effective steps to ensure vigilance and alertness on the part of the gatemen. Instructions are being complied with by the Railways. Detailed checks are exercised on the visibility for the approaching trains and the road vehicles, interlocking and signalling arrangements, knowledge of level of the gatemen, equipment at the level crossing gate etc. [See also Chapter II, Para 85]
7 (i) (b)	[See Chapter IV, Paragraph 417.]	
7 (i) (c)	[See Chapter IV, Paragraph 403.]	
7(ii)	The highest incidence of level crossing accidents, both at manned and at unmanned level crossings, was on the Northeast Frontier Railway in the case of manned and the Eastern Railway in the case of unmanned level crossings. We urge these Railways to make detailed investigations to determine the preventive measures to be taken.	Instructions were issued to concerned Railways to investigate in detail the causes of the accidents and take suitable measures for preventing accidents at the level crossings. There has been an improvement in the position of level crossing accidents on these railways.
7 (iii) (a)	[See Chapter IV—Paragraph 408]	
7 (iii) (b)	[See Chapter IV—Paragraph 419]	
7 (iii) (c)	[See Chapter IV—Paragraph 424]	

Fires in Trains

8 (i)	We suggest that a fire in a train should be treated as a train accident only when it results in death or injury or damage to property of Rs. 500 and above. Other cases of fires should, however, be duly accounted for and thoroughly investigated.	Instructions were issued to the Railways advising that the change proposed by the Committee in definition of fires for the purpose of treating them as train accidents has been accepted and that fires should be accounted for according to the recommendation. The changed definition of fires was given effect to from 1st April 1964. These instructions are being followed by all the Railways.
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APPENDIX—contd.

1	2	3
8(ii)	More passenger trains were involved in fires than goods trains on both the gauges. The Central, the North Eastern and the Western Railways, where the incidence is abnormally high, should make special efforts to bring them down.	Instructions were issued to the Central, North Eastern and the Western Railways asking them to make special efforts to bring down incidence of fires in trains. Copies of the letter were also endorsed to the remaining railways. The incidence of fires in trains on the three Railways has come down both in respect of passenger as well as goods trains.
8(iii)	The number of cases, in which the causes of the fires could not be established, is unduly high. We suggest that the Chief Operating Superintendents should personally satisfy themselves before accepting such findings that the cause cannot be established.	Instructions were issued to the railways that the recommendation should be strictly implemented. This is being followed by all the railways. [See also Chapter II, Para 117].
8(iv)	[See Chapter IV—Paragraph 567.]	
8(v)	Sparks from engines were responsible for 18 per cent. of the fires in passenger trains and for 15 per cent in goods trains. We recommend that a suitable type of spark arrester should be designed by the Research, Design and Standards Organisation and fitted on all the locomotives within a period to be specified.	All steam locomotives on Indian Railways have been fitted with spark arresters of a suitable design. [See also Chapter II, Para 115].
8(vi)	Railways should intensify their propaganda for warning passengers of the danger of fires breaking out in trains and of the penal consequences of their acts of omission and commission.	Instructions were issued to the Railways bringing to their notice the recommendation of the Kunzru Committee and advising them to launch an intensive safety campaign on the lines suggested by the [Kunzru] Committee. The Railways are taking necessary action in this regard. As regards the enhancement of fine, the matter is being processed for amendment of Indian Railways Act in consultation with the Ministries of Law and Home Affairs.

Accidents on Narrow Gauge

9(i)(a)	Collisions on the narrow gauge lines have been few and far between.	This is only an observation and does not call for any specific action.
9(i)(b)	Derailments constitute 78 per cent. of the accidents. Their incidence was the heaviest on the Darjeeling-Himalayan Section of the Northeast Frontier Railway.	This is only an observation and does not call for any specific action.
9(i)(c)	72 per cent of the derailments on the narrow gauge occurred in midsection.	This is only an observation and does not call for any specific action.
9(i)(d)	33 per cent of the derailments in midsections and 16 per cent. of those at stations were due to carriage and wagon defects, partly caused by the high percentage of overaged rolling stock on the line. We suggest that all new stock should be provided with standard bearing springs.	All new stock is provided with standard bearing springs. [See also Chapter II, Para 27].
9(i)(e)	Trains on the Darjeeling-Himalayan Section should be provided with vacuum brakes without delay.	The trials undertaken by Railways and Research, Design and Standards Organisation to guarantee the satisfactory operation of a newly developed vacuum brake system, have been completed and the locomotives working on this section are now being fitted with vacuum brake system. Fifty-two new coaches built by North Eastern Railway for this section have been provided with vacuum brake equipment. It will now be possible to operate passenger trains on this section with vacuum brakes progressively.

APPENDIX—*contd.*

1	2	3
9 (i) (f)	13 per cent. of the derailments were caused by track defects. We urge the necessity of maintaining the track to the required standards.	The rail and sleeper renewals on narrow gauge have been stepped up. The supply position of Permanent Way material is now satisfactory. The relaying on narrow gauge has generally been maintained at a higher level consistent with resources. [See also Chapter IV, Para 359].
9 (i) (g)	Another 19 per cent of the accidents were due to failures of the staff like incorrect setting and non-locking of points, overloading of wagons, excessive speed etc. We consider that wherever the intensity of train services is more than three trains each way, rudimentary interlocking and block instruments should be provided within a reasonable period.	Necessary instructions were issued to Railways in March, 1964. Railways are taking necessary action for implementing these instructions. However, for such sections as are unremunerative and the question of retention of these sections is under consideration, a dispensation for implementation of these instructions has since been granted to some Railways and the question for granting similar dispensation to other Railways, who have approached in the matter is under consideration. [See also Chapter IV, Para 435].
9 (i) (h)	Level Crossing accidents on the narrow gauge are mostly confined to the Northeast Frontier and Western Railways.	This is an observation. However, necessary instructions were issued to the Northeast Frontier Railway and the Western Railways.
9 (ii) & (iii)	[See Chapter IV—Paragraph 576.]	

CHAPTER III—STATISTICAL ANALYSIS OF ACCIDENTS—RAILWAYS

- 10 We recommend certain short-term and long-term targets to which the incidence of different categories of important train accidents should be brought down by all Railways
- The long term and short term targets for consequential accidents fixed by the Committee were communicated to the Railway, asking them to make an all out effort to attain the targets prescribed by the Committee. These targets were later recast in terms of per million kilometres and communicated to the Railways in November, 1965. From the performance of the Railways during the period from 1962-63 to 1966-67 it was observed that the Railways had improved upon the short term targets suggested by the [Kunzru] Committee in almost all categories and it was found that the short term targets had lost their significance. It was, therefore, decided to have only an all-Railway target for broad gauge and metre gauge separately. These targets are 10 per cent less than the best performance on any Railway based upon the figures upto the year 1967-68.
- [See also Chapter II, Para 21].
- Central Railway*
- 11 Our analysis of accidents on the Central Railway shows that the collisions between trains and shunting engines on its broad gauge section have been high, that the average incidence of derailments on its metre gauge section has been 82 per cent more than on the broad gauge and that the station staff have been responsible for a very large number of collisions and derailments. This indicates the need for a more thorough check on their work.
- Central Railway was asked to take suitable action to implement the suggestion of the [Kunzru] Committee. These instructions are being complied with by the Railways. The suggestion that Traffic Inspectors should not generally be in charge of more than 20-25 stations has been implemented on all Railways.
[Regarding the concluding portion of the Board's comments, see also Chapter IV, Para 296].

APPENDIX—*contd.*

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12	We find that the drivers were responsible for large number of derailments, a good number of collisions and for most of the cases of disregard of signals, whose incidence was the highest on this Railway. We suggest that the Railway Board's instructions regarding the minimum vacuum in the Guard's brake van should be brought into force, not later than the 31st March, 1964 and the drivers should be given better and regular training in schools and on the foot-plate; for this purpose, the strength of Loco Inspectors should be augmented.	Railways have implemented. [See also Chapter II Paras 39 and 56]
13	We find that midsection derailments constituted the bulk of derailments on the metre gauge and that carriage and wagon defects were the largest factor responsible for them. We observed that proper attention was not being given to wagons in Matunga Workshops.	The Railway was advised to ensure that proper attention is given to the wagons repaired in Matunga Workshops. The wagons turned out of Matunga shops are now inspected by a Shop Inspector before offering the wagons for inspection to the Neutral Control Staff.
<i>Eastern Railway</i>		
14(i)	The number of collisions on the Eastern Railway was the highest of all the broad gauge railways during the last six years, although there has been a general trend towards a reduction in their number.	The Railway was asked to make a study of the circumstances in which collision between trains and buffer ends occur. The position has since considerably improved on this Railway.
14(ii)	A large number of collisions between trains and buffer ends or other stationary objects has been a peculiarity of this Railway.	The Railway was asked to make a study of the circumstances in which collision between trains and buffer ends occur. The position has since considerably improved on this Railway.
14(iii)	[See Chapter IV—Paragraph 447.]	
14(iv)	The reception on or despatch of trains into blocked lines or sections accounted for 30 per cent of the collisions, which indicate the need for greater vigilance on the part of the station staff.	Eastern Railway was addressed to continue their efforts to further bring down the incidence of collisions. As a result of the efforts made by the Railway the number of collisions caused by reception of trains on blocked lines or despatching trains into blocked sections or incorrect setting of points has come down considerably.
14(v)	[See Chapter IV—Para 349]	
15	We find that the proportion of midsection derailments on the Eastern Railway has been increasing mainly on account of carriage and wagon defects. One-third of the train partings in India were on this Railway and 60 per cent of them resulted from breakage of the drawbars, links etc. Besides the early completion of the programme of replacement of drawbars of Class II steel by those of Class IV steel, we suggest that the procedure for the maintenance of rolling stock should be radically improved and strengthened on this Railway.	The Railways were asked to take steps to review the repairs and maintenance organisation and procedure for rolling stock on each Railway. In order to improve the position wherever necessary and action should also be taken to expedite the change over from Class II to Class IV steel drawbars. Procedure for maintenance of rolling stock has been radically improved and strengthened on the Eastern Railway; with the result that the number of midsection derailments and train partings have progressively come down.
16	[See Chapter IV—Para 359].	
<i>Northern Railway</i>		
17	We find that there has been a general downward trend in the occurrence of collisions and derailments on both the gauges of the Northern Railway.	It was only an observation and did not call for any specific action.

APPENDIX—*contd.*

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| 18 | Our analysis shows that the station staff were responsible for an abnormally large number of collisions, averted collisions and block irregularities. | The Northern Railway was advised to take punitive as well as educative remedial measures. The incidence of such accidents has since come down on the Northern Railway. |
| 19 | The position regarding train partings and hot axles on passenger and goods trains is unsatisfactory on both the gauges and we consider that the maintenance of coaches on the broad gauge and wagons on both the gauges require considerable improvement. | The Railways were asked to improve the maintenance of carriages and wagons and to take effective measures to minimise the incidence of hot boxes. The Railways were also asked to examine position of repair and maintenance of carriages and wagons and take suitable steps to improve the standard of maintenance wherever necessary. |
| 20 | Our studies disclose wide variations in the incidence of accidents on the two gauges, due to the lack of adequate attention to the metre gauge Divisions. We suggest full investigation into the causes of this disparity and early steps to improve the position on the metre gauge. We also suggest consideration of a reduction of the size of the Railways if the situation demands. | A Committee of Heads of Departments was set up. The Northern Railway took necessary action on the recommendations of the Committee. As a result the number of derailments have been coming down steadily on the metre gauge portion of Northern Railway. The details of action taken in regard to the size of the Northern Railway are given in the remarks against recommendation No. 76. It has been considered that the stage for reducing the size of the Railway has not yet come. |
| <i>North Eastern Railway</i> | | |
| 21 | Our analysis of accidents on the North Eastern Railway shows that the incidence of collisions has been the highest among the metre gauge Railways and the incidence of derailments, averted collisions and block irregularities was also very high. Fiftyfour per cent of the collisions on the Railway were between trains and shunting engines and a large majority of the derailments took place at stations. | A Committee of Heads of Departments analysed and examined the factors responsible for high incidence of collisions and derailments on this Railway. All the recommendations made by the Committee have been implemented. Except in the case of collisions the incidence in other categories i.e., derailments, averted collisions, and block irregularities on the Railway has been showing an improving trend. |
| 22 | This Railway alone accounted for 43 to 49 per cent of different types of staff failures on all the metre gauge Railways. We comment on the widespread lack of knowledge of basic rules among the Operating staff and suggest measures for improvement in this respect. | The Safety Organisation has been engaged in an intensive safety campaign which is primarily educative in content, to arouse the safety consciousness of the staff. The Railway has been addressed from time to time to pay special attention to the knowledge of staff in regard to safety rules and their observance. |
| 23 | Among the metre gauge Railways derailments due to track defects were the highest on this Railway (North Eastern). Defective track material, mostly in station yards at or near the points, accounted for the largest number of such derailments. The condition and maintenance of points and crossings were admitted to be poor. Sixty per cent of the track was under speed restrictions at the time of our inspection. | There was no section under speed restriction on North Eastern Railway due to track defects as on 31-3-67. The track renewals on this Railway were stepped up. |
| 24 | We find that 41 per cent of the derailments due to engine defects on the metre gauge occurred on this Railway. The position regarding engine failures also has been unsatisfactory. We suggest that the Railway should take steps, with special assistance from the Railway Board, to get over the shortage of spare parts, the inadequacy of competent supervisors and the wide-spread illiteracy among drivers. | The Railways were asked to pay special attention to the repair and maintenance aspects, keeping in view the observations of the Railway Accidents Committee and to ensure that the rolling stock is always maintained in good fettle. |

APPENDIX—*contd.*

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<i>Northeast Frontier Railway</i>		
25	We are doubtful about the utility of the peculiar Upper Quadrant Signalling system on the Northeast Frontier Railway, and suggest its conforming to the recognised pattern.	The work of modifying 2-aspect Upper Quadrant Signalling at 32 stations, out of 47 stations, to conform to the recognised pattern has been completed. Out of the remaining 15 stations, 14 have been provided with panel interlocking under C.T.C. and one station is to be closed down.
26	We find the incidence of derailments on this Railway to be highest among all metro gauge Railways and of collisions to be next only to that on the North East Railway. Collisions between trains and trolleys constituted their largest proportion and the majority of derailments took place at stations.	All but two of the recommendations made by the Committee of Heads of Departments have been implemented. One is in regard to divisionalisation of the railway which is now being re-examined by the Efficiency Bureau and the other in connection with the provision of lifting half barriers in regard to which trials are being carried out. The Safety Organisation has been engaged in an intensive educational and admonitory safety campaign to arouse the safety consciousness of the staff. As a result of these measures, the incidence of consequential accidents has been showing a steadily declining trend.
27	The failure of staff leading to accidents on this Railway were only next above the worst figure of the North Eastern Railway. We find the finalisation of accident cases to be slowest on this Railway and even then, the responsibility is not being clearly fixed in a large number of cases of derailments.	The performance of the Railway in regard to the finalisation of accident cases is being watched and it is observed that the Railway has now been finalising the accident cases within the schedule laid down by the Railway Board. In regard to the fixation of responsibility instructions were also issued to the railways in terms of para 22 of Part I of the (Kuzru) Committee's report. [See also Chapter II para 56 and Chapter IV Para 322].
28	We comment on the heavy shortages in all the categories of operating and maintenance staff and their insufficient education and training, and on the poor quality of supervision. We suggest the following special steps to get over this problem:	There are already vocational training centres on the Railways for imparting vocational training to children of railway employees and such training schools will continue to be developed on the Railways.
	(a) Opening of a polytechnic at a suitable place in Assam to provide courses in railway subjects, the sons of the railway employees being given preference for admission ;	This recommendation was examined in detail and it was considered that the allowances at present payable are adequate.
	(b) Sanction of a substantial special allowance for staff serving in unhealthy and difficult localities;	Instructions were issued in December, 1964 that transfers in the category of Station Masters/Assistant Station Masters volunteering to go on Northeast Frontier Railway would be given a special bonus ranging from Rs. 30 to Rs. 45 per month depending on the years of experience of the volunteers. No shortage has been reported thereafter. At present there is a small surplus on Northeast Frontier Railway being absorbed in other categories. [See also Chapter IV para 228;]
	(c) Offer of sufficiently higher emoluments to the staff volunteering for transfer from other Railways, to fill up the existing vacancies;	

APPENDIX—contd.

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| 28. | (d) Retaining Class I Officers for a sufficiently long time on this Railway by offering the inducement that promotions upto the Junior Administrative Grade should be confined to those on the Railway, subject to their fitness; and | As a general rule, promotions to the Junior Administrative Grade in the three major departments viz. Civil Engineering, Traffic and Mechanical Engineering are being regulated Railway-wise except when there is wide disparity in the seniority of the officers considered for such promotion on other Railways. Promotion in the minor departments i.e. other than the three mentioned above is regulated on all-Railway basis. Keeping in view this procedure, it has already been decided that regular cadre of the Northeast Frontier Railway should be finalised by making inter-Railway transfers wherever considered necessary. |
| | (e) Provision of educational assistance on a liberal scale to the children of the staff and officers. | Railways already provide educational assistance to Class III and Class IV employees who are compelled to send their children away from their headquarters for purpose of education due to absence of educational facilities of the requisite standard at the place of their posting.

The Government has also adopted a scheme according to which reimbursement of tuition fees in respect of children of Central Government employees is allowed. |
| 29. | We find that only three miles of relaying out of 223 miles due in 1962-63, was completed. This may partly account for the large number of track defects leading to derailments on the Railway. | The position has since improved. 617 kilometres of rail renewals and 353 kilometres of sleeper renewals were carried out in the Third Plan period on the Northeast Frontier Railway. Another 45 kilometres rail renewals and 88 kms. sleeper renewals were carried out in 1966-67. The above figures are exclusive of casual renewals of rails and sleepers. |
| 30. | We find the incidence of train partings both on passenger and goods trains on this Railway (Northeast Frontier) was the highest among the metre gauge Railways. We suggest that the steps taken as a result of the detailed analysis of train partings carried out by the Chief Mechanical Engineer of this Railway should be implemented on all Railways. | Railways were advised that the method of analysis and precautions taken by the Northeast Frontier Railway to bring down the number of trains partings, should be followed on their system also. The other Railways have since implemented these. |
| 31. | We express our misgivings about the Railways' ability to meet the crying need for the rehabilitation of the obsolete track and for the creation of facilities for the overhauling of the engines and rolling stock, unless assistance is given by other Railways and the Railway Board. | The Railways were asked to pay special attention to the repair and maintenance aspect keeping in view the observations of the Railway Accidents Committee (Kunzru Committee) and ensure that the rolling stock is always maintained in good fettle. |
| <i>Southern Railway</i> | | |
| 32. | Our analysis of accidents and our inspections on the Southern Railway show that shortcut methods are widely prevalent and these remain undetected by the supervisors, who are found carrying out only superficial checks on the working of the staff. | Southern Railway was asked to pursue with vigour the drive to wipe out the use of shortcut methods of working. Staff indulging in shortcut methods are dealt with severely. To improve the quality of inspections additional posts of Traffic Inspectors in higher grade have been provided on the Railway. |
| 33. | We recommend a review of the position about the Assistant Station Masters being required to pull levers in cabs on this Railway and the provision of levermen or point-men where justified. | The recommendation has since been implemented at most of the important junction stations on the Railway and its extension to other stations is being pursued by the Railway. |

APPENDIX—contd.

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34.	We find that derailments on the Railway have been increasing on both the gauges. While on the broad gauge there was an increase in derailments at stations, midsection derailments were heavy on the metre gauge; 41 per cent of the latter were attributed to defective loading, for which special action is proposed.	A study of derailments due to uneven loading was undertaken by the Safety Directorate and its report was discussed by the Standing Safety Committee, who decided that the matter should be referred to Research, Design and Standards Organisation to go into the question of evolving suitable, simple and inexpensive measures for the loading, securing and packing of consignments which according to the study were susceptible to uneven loading and/or shifting on run. The matter is engaging the attention of the Research, Design and Standards Organisation.
35.	Track defects on the Southern Railway are highest among all the broad gauge Railways and the relaying of track and the provision of ballast are lagging very much behind the sanctioned programmes.	The position has since improved. 1879 Kms. of rail renewal and 2314 Kms. of sleepers renewals were carried out in Third Plan on Southern Railway. During 1966-67 and 1967-68 a further 750 Kms. of rail renewal and 707 Kms. of sleeper renewals were carried out on present Southern Railway and Vijayawada and Hubli Divisions of South Central Railway.
36.	We find that the incidence of derailments on this Railway due to engine defects is the highest among the broad gauge Railways and that the position regarding engine failures is very unsatisfactory. Owing to the non-availability of material, shortage of staff and the poor calibre of the men in the sheds, repairs to engines were not receiving proper attention.	Locomotives on Southern Railway are now receiving adequate attention. Material and staff position is satisfactory. Proper check is being maintained by the Railway to ensure that locomotives continue to receive proper attention.
<i>South Eastern Railway</i>		
37.	We find that the incidence of collisions on the South Eastern Railway has been the second highest among the broad gauge Railways and a large number of collisions between trains and trolleys were responsible for the sharp rise in collisions in 1962-63.	South Eastern Railway was instructed to apply the preventive measures for decreasing collisions between trains and trolleys which have proved successful on the Eastern and North-east Frontier Railways. The position has since improved on this Railway.
38.	The derailments on this Railway were the highest among the broad gauge Railways. Midsection derailments showed an upward trend from 1957-58 to 1961-62, but came down in 1962-63. The unconsolidated track on newly constructed lines and the defects in the design of new BOBs wagons have been largely responsible for this trend.	South Eastern Railway was addressed to analyse factors responsible for the upward trend of midsection derailments on that Railway and take remedial measures. As a result of the action taken by the Railway, the position on the South Eastern Railway in regard to total number of derailments as also midsection derailments has considerably improved.
39.	We find that owing to the heavy shortfall in the supply of track materials, the standard of the track and its maintenance lag behind the actual requirements, while traffic is growing and electric and diesel traction is being adopted and this appears to be a reason for the increase in derailments.	The shortfall in track renewal was due to non availability of matching components of track materials. The position has since improved and the relaying programme is making satisfactory progress.
40.	We find that the carriage and wagon defects leading to derailments are very high and the condition of wagons is generally unsatisfactory on this Railway. The Railway should tighten up its train examination by providing sufficient train examining staff to complete the work satisfactorily within the permissible time. There is need for giving training to the staff in the maintenance of the new type of wagons and for improving the supply of stores for the sick lines and the workshops at Kharagpur.	The Railway was advised to provide adequate number of trained examining staff to improve the maintenance of wagons. Steps should also be taken to improve the supply of stores to the sick lines and to Kharagpur workshops. Adequate TXR staff and facilities have been developed and staff have been trained for maintenance of new type of stock.

APPENDIX—contd.

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	<i>Western Railway</i>	
41.	The incidence of collisions and derailments on the broad gauge and of derailments on the metre gauge of the Western Railway have been the lowest among all the Railways. There was a rise in such accidents from 1958-59 to 1961-62, followed by an improvement in 1962-63, the station derailments constituting the major proportion of the derailments.	This is only an observation.
42.	The staff failures have been responsible for 46 per cent of the station derailments on the broad gauge and 44 per cent of those on the metre gauge. We found some of the station staff having a casual approach to train passing duties which was not being checked and corrected by supervisory officials.	The Railway was instructed that the various steps to improve staff performance as suggested by the [Kunzru] Committee in its other recommendations should be taken in order to eliminate such failures. Emphasis was also laid on the need for detailed and regular checks at various levels. These instructions are being complied with by the Railways.
43.	Permanent Way failures on the metre gauge and carriage and wagon failures on the broad gauge have shown an increase and we suggest immediate action to arrest the deterioration.	The Railway was directed to pay more attention to maintenance of metre gauge and gauge lines as minor defects in smaller gauge lines have more adverse effects on the running of trains. They were also directed that existing maintenance practices should be improved particularly on metre gauge and narrow gauge and appropriate action taken to ensure better maintenance. The Railways were also asked to pay special attention to the repair and maintenance aspects, keeping in view the observation of the [Kunzru] Committee, and ensure that the rolling stock is always maintained good fettle.
44.	The high incidence of engines failure due to mismanagement by the engine crew and our analysis of disregard of signals indicate the inefficiency of the drivers, about which we received wide-spread complaints during our tour. We consider that this situation is due to the lack of timely anticipation of the requirements of the footplate staff, leading to inadequate recruitment and the eventual promotion of inexperienced or even illiterate staff as drivers. We suggest personal instructions and more training to the inexperienced and potential Drivers.	The incidence of engine failures on the Western Railway has shown considerable improvements.
45.	We find that the engine defects leading to the derailments on the broad gauge were highest on the Western Railway; this has been attributed to inadequate maintenance facilities and equipment and inefficient workmanship in sheds and shops; these need to be rectified early.	The Railway was asked to pay special attention to the repair and maintenance aspects and ensure that the rolling stock is always maintained in good fettle. Adequate repair and maintenance facilities both in sheds and shops have been provided and rigid inspections procedure introduced.
CHAPTER IV—THE HUMAN FACTOR		
46.	Our analysis of accidents during the last six years has shown that a majority of them can be attributed to human failure.	This is only an observation and no specific action was called for in the matter.
47.	[See Chapter IV—Para 222.]	
48(i) to (iii) & 49	[See Chapter IV—Para 270.]	
50.	[See Chapter IV—Para 280.]	
51(i) to (iv)	[See Chapter IV—Para 249.]	
52 to 53	[See Chapter IV—Para 199.]	
56 & 57 (i) to (vi)	[See Chapter IV—Para 283.]	

APPENDIX—*contd.*

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39.	We suggest modifications in the existing rules of selection to supervisory posts which confer triple weightage of seniority.	Revised rules, on the basis suggested by the [Kunaru] Committee for selection to supervisory posts have been promulgated. These orders are being followed by all the Railway administrations.
59.	We suggest that after selecting the right type of persons as supervisors, it is essential to equip them with the technical knowledge required for their job and to give them training to develop their skill in management.	Arrangements for conducting Supervisors courses in Supervision and Management were made in the Zonal Training School, Chandausi. Instructions have been issued to the Railways that selected Senior Supervisors from all the Zonal Railways should receive training in the Training School at Chandausi. A course each in 1964 and 1965 and two courses in 1967 were arranged. In regard to the training courses for Junior Supervisors, instructions were issued to Railways in March, 1964 to take immediate steps for arranging such courses where they had not already been arranged. To enable the Railway administrations to make immediate arrangements, a syllabus was also circulated for their guidance.
60.	We propose the opening of a Central Institute at Baroda for training senior supervisors of the different Railways and the creation of similar facilities for junior supervisors in the Zonal Training schools. We also suggest that Railways should derive benefit from the various supervisors training courses run in India and abroad.	
61.	[See Chapter IV—Para 290].	
62.	We are of the view that Senior Supervisors should not be permitted to become members of staff unions, for which if necessary, the Indian Trade Union Act may be suitably amended. They may, however, form a Union of their own to represent their interests. Sri T. B. Vittal Rao dissents from this recommendation.	This recommendation has been examined in consultation with the Ministry of Law but in view of the opinion tendered it will not be possible to amend the Trade Union Act, to exclude Senior Supervisors from becoming members of the Trade Unions.
63 & 64.	[See Chapter IV—Para 290].	
65.	[See Chapter IV—Para 322].	
66.	We recommend a system of accelerated promotions or advance increments to supervisors and officers as a reward for excellent performance or sustained outstanding work. For those in lower grades of Class III service and in Class IV service, we consider that the best reward will be to provide for their children's education by opening polytechnics and the grant of scholarships. We also suggest the employment of sons of railwaymen with creditable record of service.	The Railways have been advised that a system of accelerated promotions or granting of increments in advance to Supervisors and Officers for outstanding performances or for a record of sustained outstanding work would be conducive to efficiency and constitute suitable incentives. It should be impressed upon the officers sitting on the selection boards that in making appointments to "selection posts" utmost care should be taken to evaluate the professional ability of the candidates on strict standards.
67.	Several Senior Scale Officers with insufficient experience and working as Divisional or District Officers. This is due to inadequate planning and the erratic rate of recruitment and promotion to Class I service during the Second Five Year Plan. We suggest that the requirements of the Fourth Plan should be worked in time. We recommend that no officers should be promoted to the Senior Scale, unless he has completed at least six years of service in the Junior Scale and also suggest certain measures for overcoming the interim shortages.	In an expanding organisation, it is not always possible to adhere to a minimum period of six years' service before a junior scale officer is promoted to senior scale. However, the various suggestions made by the [Kunaru] Committee in this respect will be kept in view.

APPENDIX—contd.

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| 68. | We were impressed by the training facilities developed in the Railway Staff College, Baroda, the Institute of Signal and Telecommunication Engineering, Secunderabad and the Advanced Permanent Way Training School, Poona, but the number of officers trained in them during the last three years has been much below the number that should have passed through a refresher course. The existing courses in these institutes do not adequately cover the problems of man-management and art of supervision and we suggest their inclusion. We suggest the holding of regular seminars for administrative officers, and recommend that larger number of officers should be sent for training in Institutes of Management and Administration in India and abroad. In view of the small number of persons receiving training at the Poona Institute, we suggest considerations of its being made a part of the Baroda College. | Refresher courses at Railway Staff Colleges Baroda and Indian Railways School of Signal Engineering and Telecommunications, Secunderabad are arranged as a regular measure. Refresher courses have now again been introduced at Poona School also this year for Senior Scale Officers.
The question of shifting the Advanced Permanent Way Training School to Baroda has not been found feasible and it has been decided to develop facilities permanently at Poona. Seminars for Administrative Officers have commenced at Railway Staff College Baroda. The facilities for training in Institutes of Management in India are being utilised to the extent feasible. |
| 69. | We strongly recommend that the principle of selecting for Administrative posts the best man available and not the Senior man if suitable, should be restored. We propose the constitution of a Screening Committee of senior officers to recommend the names of officers for filling posts of Heads of Departments and Divisional Superintendents who should be hand-picked persons. | While the principle of selecting officers for administrative posts on merit is accepted, seniority has also to be taken into consideration for eligibility for such promotions.
Setting up a separate Screening Committee, as suggested, is not considered necessary, as all promotions to such posts are ordered after a good deal of screening by the Members of the Board collectively. |
| 70. | We are of the view that the confidential report of officers should be precise and explicit and be invariably scrutinised by the next senior officers. They should also provide for a general assessment in the narrative form. | Pursuant to the recommendations made by the [Kunzru] Committee, an additional item "General Assessment" was introduced in Section II of the confidential report form, with an explanation under 'Instructions' printed on the reverse of the form that, "General Assessment" should be recorded in a narrative form, summing up, in general terms, the officer's personality, capabilities and potentialities, including qualities and shortcomings if any. In the case of technical officers, their aptitude for design and research work should be particularly commented upon in the general assessment".

All the other aspects brought out in the recommendation have been amply covered by the Code provisions. |
| 71. | We deprecate frequent transfers of officers from one Railway to another and suggest that an officer in the Administrative grade should normally be retained on the same Railway and on the same post for at least three to four years. | Necessary instructions in this regard were issued to Railways in June, 1964. |
| 72. | [See Chapter IV—Para 319]. | |
| 73. | We make the following suggestions for reducing the paper work in order to enable officers to exercise sufficient checks on the working of the staff and maintain personal touch with them. | |

APPENDIX—contd.

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73.	(i) Codes and procedures should be simplified.	Some of the Codes have already been revised and procedures simplified. It was decided that the publications which were last revised before 1956 may be examined for further revision. Accordingly, new editions of Indian Railway Way & Works Manual and the Indian Railway Signal Engineering Manual have since been brought out. The Manual of Railway Board's Office Procedure has been revised and is under print. The Indian Railway Code for Mechanical Department (Workshops) does not call for complete revision. Portion dealing with "Payment by Results" alone is being revised.
	(ii) Periodical reviews should be made to eliminate or modify some of the statements and statistics. The first review should be immediately undertaken by the Efficiency officers on the Railways.	These reviews are being made and repeated every three or five years and results of these reviews interchanged among the Railways in order to get uniform benefit from them. The Efficiency Bureau also undertakes reviews as and when considered necessary.
	(iii) The administrative levels at which specific problems should be dealt with, should be laid down and rigidly adhered to.	This procedure is already in force.
	(iv) The number of officers and supervisors should be suitably increased and organisational changes introduced to reduce their jurisdiction to manageable charge from the viewpoint of safety and efficiency.	Action has been taken by all the Railways to review cadre of supervisors and additional sanctions accorded where necessary.
	(v) Personal Assistants should be provided to the important Heads of Departments, the Divisional Superintendents in charge of large Divisions and in special cases, to Divisional Officers. We suggest that officers should be provided with stenographers on a more liberal scale than at present.	Heads of Departments have been given P.As and Divisional Superintendents have been provided with additional stenographers. The scale of stenographers to other officers has been determined by the General Managers. Senior Scale Officers have one steno and Assistant Officers, one, for two officers. Only on Northern Railway Senior Scale Officers concentrated in one place have been given two stenographers for three officers.
	(vi) Senior Scale Officers and above should be authorised to incur expenditure upto certain limits without prior concurrence of Accounts Officers.	As the existing rules already permit the exercise of certain powers by senior scale officers without prior financial concurrence, views of the Railways had been called for in pursuance of this recommendation to indicate the powers they would like to be delegated to their senior scale officers in addition to what were being already enjoyed. Recommendations received from the Railways were examined and further delegations were agreed to.
	(vii) Officers should be discouraged to seek directions from above in matters within their competence.	This practice is already in force.
74.	We are convinced that the workload on certain Divisions has exceeded the optimum capacity of the existing Divisional organisation and therefore reiterate our earlier recommendation and urge an expeditious examination of the workload on certain Divisions of the Railways.	The Efficiency Bureau have completed the examination of workload on the 11 Divisions ^a mentioned in para 115(i) of the Report of the Railway Accidents Committee [Kunzru Committee] (Part II) and made some recommendations. As a result, strengthening of the divisional organisation has been done besides any other strengthening which has occurred in the divisional organisation in the Engineering, Signalling and other departments by the justification of their departmental workload. The above relief measures were based on the workload as assessed on 1963-64 data. Further review of these divisions with respect to functional strengthening/bifurcation, and of other divisions with high workload is in progress in the Efficiency Bureau.

APPENDIX—contd.

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75	We suggest the introduction of the Divisional Organisation on the North Eastern and North-east Frontier Railways which are at present working on the District pattern, in order to provide mature and on-the-spot guidance to inexperienced District Officers.	The matter has been examined from time to time. It was decided to introduce divisionalisation on the North Eastern Railway with marginal re-adjustment in the territory of North Eastern and Northeast Frontier Railways. The scheme has however been held in abeyance pending finalisation of an integrated scheme for divisionalisation of both the North Eastern and Northeast Frontier Railways.
76	We consider the workload on the three Railway Zones to be heavy and recommend an expert study to examine the present workload, its future projection with its impact on different zones.	The workload and the efficiency-cum-operating indices of the Zonal Railways are continuously under review by the Efficiency Bureau. A detailed examination of the workload and the efficiency-cum-operating indices of these three railways was also undertaken by the Efficiency Bureau and it was decided to carve out a new zone (South Central Railway) out of the erstwhile Southern and Central Railways to reduce their territorial jurisdictions and hence their workload. The South Central Railway was formed on 2-10-1966. In regard to Northern Railway the proposal to reduce it territorially was shelved during the emergency in 1962, this being a border Railway. Since then the operational workload on the Indian Railways as a whole has not come up to anticipated level and the proposal for its territorial jurisdiction has, therefore, not been pursued till the national economy pick up again requiring relief to the zonal organisation.
77	We suggest that there should be only one recognised Trade Union on each Railway Zone and its office bearers should be drawn from the serving Railway employees. We expect the Unions to bring only well-authenticated grievances of individuals to the notice of the Railway administrations at appropriate levels, after normal channels of appeal have been exhausted. They should also refrain from sponsoring cases of staff punished for causing accidents, and should help in an expeditious finalisation of accident enquiries.	This is a recommendation concerning the trade unions primarily, where they are called upon to take necessary action to comply with the recommendation. Therefore, attention of the two All India Federations (A.I.R.F. and the N.F.I.R.) to which all the recognised trade unions on the Railways are affiliated has been drawn to this recommendation.
78	The medical facilities, both in scale and in quality, are second to those of no other organisation in India.	This is an observation.
79	We are glad to note that as a result of our discussion with the Railway Board, instructions have been issued to calculate the overtime on a two-weekly instead of the present monthly basis.	Overtime in respect of staff classified as "Intensive" and "Continuous" under the Hours of Employment Regulations is calculated on half-monthly basis.
80	[See Chapter IV—Para 312]	
81	We attach great importance to the provision of suitable running rooms and early completion of standard facilities in all of them. We make suggestions for improving the services available in the running rooms.	The Railways were directed to examine how the essential facilities could be provided in the existing running rooms with minimum alterations. The Railways have generally provided essential facilities. The Railways were also directed to try out the suggestion for provision of cubicles with light partition walls for every individual in a few running rooms. Some of the Railways have since tried provision of separate cubicles in one or two running rooms as an experimental measure.

APPENDIX—*contd.*

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CHAPTER V—SIGNALLING		
82	We consider signalling to be the essential instrument of safety as it minimises the impact of human error on the safety of train operation.	This is an observation.
83(i)	Morse telegraph instruments should be progressively replaced by token instruments on all single line sections of broad gauge and metre gauge.	Instructions were issued to the Railways that the work of replacement of the Morse instruments by token instruments on sections having more than 3 trains each way should be taken on a priority basis and completed by June, 1965. This work has since been completed on all the Railways except on one section of the North Eastern Railway. With the limited resources at present and need for improving signalling and block working on other busier sections, it will not be possible to provide them on all sections with lighter traffic having three or less trains each way per day.
83(ii)	[See Chapter IV—Para 440]	
83(iii)	[See Chapter IV—Para 435]	
83(iv)	[See Chapter IV—Para 444]	
83(v)	[See Chapter IV—Para 430]	
84(i)	[See Chapter IV—Para 451]	
84(ii) to (iv)	[See Chapter IV—Para 447]	
85	[See Chapter IV—Para 457]	
86	[See Chapter IV—Para 461]	
87	We consider that the jurisdiction of the signalling officers needs to be rationalised and the frequency and quality of their inspection improved. Also that the senior officers should watch the frequency and quality of inspection by junior officers who should in their turn watch those of Inspectors.	Jurisdiction of signalling officers has been rationalised on the South Central, the Northern and the South Eastern Railways. In regard to other Railways, the subject is under investigation by the Efficiency Bureau of the Railway Board.
88	We recommend for adoption on all the Railways, the special register in use in the Loco sheds on some Railways, in which the incoming drivers record defects about signals, noticed by them on route.	The Railways were asked to introduce special register in all the loco sheds where it had not already been done. It was also stated that the drivers should be instructed to make necessary entries in the special register about the signal defects noticed en route and the Loco Foreman should intimate the Station Master concerned as also the Signalling Department officials responsible for maintenance, for expeditious rectification of the defects noticed. This is being done on all the Railways.
89	We strongly urge the early establishment of a central electrical signal workshop for manufacturing electrical signalling equipment.	In view of the limited resources, the indigenous capacity for the manufacture of electrical signalling equipment already existing in the country and now proposed to be created by well established firms with international standing, viz., M/s. Westinghouse, Sarby Farmer, Calcutta and M/s. Siemens, Bombay in their existing factories in India and also with a view to keep pace with the rapid changes that are taking place in the field of signalling technology, it has been decided that the proposal for setting up the Central Signalling Workshop may be dropped.
90 & 91	[See Chapter IV—Para 344]	
92	In order to keep the Rule Book tidy and susceptible of easy reference, we suggest the adoption of the American practice of having a Rule Book loosely bound in a folder so that whenever a rule is amended, the whole page is replaced.	Necessary instructions were issued to the Railways on the lines suggested by the Railway Accidents Committee and all the Railways have brought out their subsequent prints in a loosely bound folder.

APPENDIX—contd.

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CHAPTER VI—TRACK		
93	About 13 per cent of the derailments were caused by track defects; this indicates that the maintenance of the permanent way has not been keeping pace with the increasing traffic demands, not to speak of the requirements of very heavy traffic in future.	As a result of various measures taken to improve the track maintenance, the total number of train derailments on account of track defects as well as the percentage of train derailments on account of track vis-a-vis the total train derailments has come down considerably.
94	We welcome the new track standard laid down by the Railway Board and suggest that the economics of a larger use of 132 lb rails on some of the trunk routes should be considered.	60 kg. rails are proposed to be used in very high density lines carrying over 20 GMT per annum as these rails will have useful life up to 700 GMT (32 kg. rails having an anticipated life of 400 GMT) Drawings of suitable sleeper fittings, points and crossings etc. of these rails are being prepared by the Research Designs and Standards Organisation.
95	We suggest suitable improvements in the design of steel trough and cast iron CST/9 sleepers.	It has been decided not to encourage CST/9 sleepers on trunk routes as they are not suitable for high speed and heavy density traffic. However, improved CI sleeper to be called CST/10 is under development by the Research, Designs and Standards Organisation. Some sleeper plates have already been manufactured in the Mammad Workshop for trial purposes. Steel trough sleepers with elastic fastenings are also being introduced.
96&97	[See Chapter IV—Para 359]	
98	[See Chapter IV—Para 368]	
99	[See Chapter IV—Para 359]	
100	[See Chapter IV—Para 365]	
101	We find that the recoupment of ballast has been extremely unsatisfactory and suggest the following special steps for overtaking arrears and for working up to the increased cushion of 10 inches on important routes:	Most of the measures suggested by the [Kunzrul Committee have already been taken and special drive had been instituted on all the Railways for increasing the ballast procurement and for training out the same, as a result of which the quantity trained out during the first eight months of 1963-64 has already reached the figure of 120.3 million cubic feet.
(i)	[See Chapter IV—Para 382]	
(ii)	Traffic Inspectors or Ballast Controllers to watch the working of ballast trains.	(ii) Ballast train controllers have been posted in almost all Divisions.
(iii)	Using motor trucks for the collection of ballast on the cess.	(iii) This is being done, wherever economically feasible.
(iv)	Rapid acquisition of land for quarrying purposes; and	(iv) This is being done when required.
(v)	Installation of mechanical crushers at suitable places and examination of the feasibility of installing mobile crushers.	(v) Railways were asked to go in for mechanical crushers. As a result of above measures the recoupment of ballast has already increased.
102	We suggest that a systematic programme should be drawn up by each Railway in consultation with the Research Centre, for the stabilisation of formations made of black cotton or unstable clay soils. We suggest special watch on and proper maintenance of the newly made banks in station yards and the use of coal ash on new banks in mid-section.	Railways have been instructed to make special arrangements for stabilisation of bad banks on open line, conversions and new constructions. Programmes had been made by Railways and these are progressively taken up or investigation by the Research, Designs and Standards Organisation and for remedial measures. In construction of new formations, soil studies and suitable measures like moorum blanketing and special consolidation adopted.

APPENDIX—contd.

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103	[See Chapter IV—Para 376]	
104(i)	We make the following observations in regard to maintenance of track. We prefer the practice followed on the Central Railway in regard to through packing being carried out for as long a period as possible during monsoon and the two months of the pre-monsoon period on sections of the line where the climatic conditions permit.	Railways were instructed that in areas with rainfall upto 30", 4 days in a week shall be devoted through packing and the remaining days to clearing of side and catch water drains earth work, and picking up of slacks. Programme of maintenance during monsoon and post monsoon period will remain as laid down in the Indian Railways Way and Works Manual.
(ii)	Our observations make us doubt if the prescribed procedure for picking up slacks is effectively followed as a general practice.	Railways were directed to issue suitable instructions to the maintenance staff to ensure correct and better maintenance of track.
(iii)	[See Chapter IV—Para 382]	
4(iv)	We emphasise the importance of the opening of the road by the removal of ballast, to an adequate extent, prior to manual tamping.	These observations were brought to the notice of the Railways.
(v)	Special stress needs to be laid on ensuring the correct alignment of the track in the daily work of the gangs engaged on through packing.	
105(i)	[See Chapter IV—Para 382]	
105(ii)	[See Chapter IV—Para 387]	
106	We found variations in the method of manual packing and we give instances of defective practices on some Railways.	Instructions have been issued to the Railways to follow the practices indicated in Chapter VI of the Indian Railway Way and Works Manual and to eliminate defective practices. Railways are following these instructions to the maximum extent possible.
107&108	[See Chapter IV—Para 382]	
109	[See Chapter IV—Para 212]	
110	We feel that the Permanent Way Inspectors should take detailed notes regarding the work of the gangs in their own note books in addition to the recordings in the mate's diary.	Instructions were issued to all railways that PWIs should make detailed notes regarding the work of the gangs in the note books maintained by them. The Railways were also asked to impress the importance of this observation on the PWIs and APWIs during their training courses. Besides PWIs attached to safety organisation were also asked to see whether the instructions were actually followed. They were also required to observe track variations etc. sleeper by sleeper over short lengths. These instructions are being followed by the Railways.
111	We suggest that the Permanent Way Inspectors should be properly instructed about the importance of making observations about track variations, sleeper by sleeper, over a shortest length of the track.	
112	The Apprentice Permanent Way Inspectors should stay and actually work with the gangs over an appreciable period to learn thoroughly the duties of the gangs including the use of tools and implements.	All Railways were asked to ensure that Apprentice APWIs stay with the gangs over an appreciable period to learn thoroughly the work of gangs including the use of tools and implements. Instructions are being followed by the Railways.
113	[See Chapter IV—Para 296]	
114	[See Chapter IV—Para 300]	
115	We suggest that the Assistant and District or Divisional Engineers' note books should be properly maintained with a detailed record of the results of the inspections and these should be periodically examined by the higher officers. We suggest the issue of suitable instructions and incorporating them in the Way and Works Manual.	Instructions were issued to the railways that Assistant Engineers and Divisional Engineers should maintain note books containing detailed record of the results of the inspection and that these note books should be periodically examined by higher officers. Provision of this effect has also been incorporated in the Way and Works Manual in Para 601.

APPENDIX—contd.

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116	We suggest that the railways should start implementing the proposal to limit the jurisdiction of Assistant Engineers to about 120 miles, subject to exceptions under special circumstances.	In April, 1966 Efficiency Bureau undertook a study to frame suitable yardsticks for territorial jurisdiction of open line AENS. The study has been completed and is under consideration. Detailed instructions regarding yardsticks are expected to be issued shortly.
117	We were struck with the consequences of the rapid promotions of young officers with short service, and suggest that ad hoc arrangements should be made to give them guidance and instructions.	Ad hoc arrangements have been made to impart special training in the Advanced Permanent Way Training School at Poona to those officers who have had accelerated promotions without adequate experience.
118	The Permanent Way Inspectors and the Assistant and Divisional Engineers should profitably correlate the observations during their inspections by footplate and brakevan, with those made by actual measurements of defects.	All Railways were asked to instruct DENSE, AENS and PWIs to correlate the observation taken during foot-plate and brakevan inspection with actual measurement of track defects. Instructions are being followed by the Railways.
119	[See Chapter IV—Para 396]	
120	We consider that the operator-in-charge of the Hallade Car should be fully tested before he is given the responsibility of operating it. His interpretation of the records should also be subject to competent check periodically.	Hallade track recording charts are always periodically scrutinised by senior officers to have a check on the interpretation of the Hallade track recording staff. This has been further tightened on all the Railways on the recommendations of the Railway Accidents Committee. [See also Chapter IV Para 396]
121	[See Chapter IV—Para 396]	
122	Our conclusions in this chapter are based on limited observations and the data supplied to us. Their general applicability is a matter for further investigation by the Railways.	Further investigations were carried and the developments are indicated against each observation.
CHAPTER VII—ROLLING STOCK		
123	We find that 51 per cent of the derailments due to engine defects were on account of bad maintenance, 38 per cent were due to the failure of the material and the balance of 11 per cent was due to miscellaneous causes.	The Railways were asked to pay special attention to repair and maintenance aspects keeping in view the observations of the Railway Accidents Committee, and ensure that the rolling stock is always maintained in good fettle. Proper maintenance procedures have been introduced by all railways. [For the position relating to the years 1963-64 to 1967-68, see Chapter II, Para 61].
124	We suggest that the wear on tyres should be checked with a condemning gauge and the even, flat and root wear should be checked and recorded. All the major sheds should be equipped with wheel lathes and the tyres may be machined to the prescribed intermediate profile gauges.	Wear on tyres is now checked by condemning gauges on all Railways and proper records of the same maintained. Adequate wheel lathes have been provided in the sheds.
125 (i) to (vi)	[See Chapter IV—Para 472]	
126	[See Chapter IV—Para 491]	
127 (i) to (vi)	[See Chapter IV—Para 476]	
128	Railways which are in heavy arrears in respect of the major maintenance schedules should study their causes in each shed and division. We suggest:	

APPENDIX—contd.

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(5)	the adoption of the principle of centralised maintenance overhaul on a divisional or district basis.	The principle of centralised maintenance overhaul has been adopted on all Railways.
128.	the provision of proper machines, equipment and other facilities for undertaking the maintenance schedules;	All Railways have confirmed that proper equipment and facilities have been provided for scheduled maintenance.
(iii)	translation of scheduled items in the regional language and their exhibition on notice board for the guidance of the maintenance staff;	The practice of translating the schedules in the regional language and exhibiting them in a prominent place for guidance of the maintenance staff in the loco sheds has been adopted.
(iv)	manufacturing a few non-ferrous items in a small foundry attached to the big loco sheds where justified; and	Supply of non-ferrous items to sheds is being ensured by regular supply from shops. Setting up of non-ferrous foundries in shed is not desirable because adequate control on quality cannot be ensured without large capital investment in control equipment.
(v)	an early study of the staff required in sheds to carry out scheduled repairs and its early provision and the adoption of adequate measures to improve the quality of fitters.	Railways have since provided adequate staff for carrying out schedule repairs in accordance with the yardstick fixed.
129.	[See Chapter IV—Para 498]	
130.	We find that the Northern and Northeast Frontier Railways require expansion of workshop capacities for doing the periodical overhaul of their locomotives.	Adequate workshop capacity for periodical overhaul of steam locomotives has been developed on the Northern and the Northeast Frontier Railways.
131.	We emphasise the importance of a careful examination of the material and the manufacturing process of spare parts, which should conform to strict specifications.	Inspection Organisations have been created in all Railway Workshops to ensure that parts manufactured conform to specification.
132.	[See Chapter IV—Para 474.]	
CARRIAGES & WAGONS		
123	As the incidence of the derailments due to carriage defects on the metre gauge was five times more than on the broad gauge, there is need for more attention to the maintenance of passenger stock, especially on the Northeast Frontier Railway.	The Railways were asked to pay special attention to the repair and maintenance aspects keeping in view the observations of the (Kunzru) Committee and ensure that the rolling stock is always maintained in good fettle. Carriage maintenance work has been re-organised on the Northeast Frontier Railway and proper maintenance of coaching stock is now being ensured.
134 (i) to (v) and 135 (i) & (iv)	[See Chapter IV—Para 503]	
135. (iii)	In order to obviate derailments caused by broken axles, cold or hot, we suggest that—a uniform practice for the thorough examination of journals should be introduced.	The Railways were asked to follow the recommendation to the maximum extent possible. They were also advised that the flaw detectors may be progressively provided in other loco sheds, workshops and major sick lines through the normal Machinery and Plant Programme.
136.	We find that 56 per cent of the derailments due to carriage & wagon defects on the broad gauge and 58 per cent on the metre gauge were caused by bad maintenance, thereby indicating the need for a more thorough examination and proper repairs to rolling stock in station yards and sick lines.	Necessary instructions were issued to Railways. Procedure for maintenance of rolling stock has been radically improved and strengthened on the Railways.

APPENDIX—contd.

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137.	[See Chapter IV—Para 539]	
138. & 139.	[See Chapter IV—Para 539]	
140	[See Chapter IV—Para 515]	
141(i)	We suggest the following measures for improving train examination and repairs : A concerted drive should be made by the Security Department in cooperation with the Mechanical Department in order to prevent frequent and extensive tho of materials and parts of wagons.	This recommendation was brought to the notice of the Railways and instructions were reiterated that concerted drives jointly by the Railway Protection Force and the staff of the Mechanical and Electrical Departments should be organised with a view to localising and checking thefts/losses of fittings from the Rolling Stock. A new Act viz., Railway Property (Unlawful Possession) Act, 1966 was also passed and came into force with effect from 1-4-1966.
141(ii) & (v)	[See Chapter IV—Para 507]	
141(iii)	The programmes for increasing the capacities of sick lines, with adequate equipment in keeping with the needs of the present day conditions of work and traffic, should be implemented.	The Railways were asked to pay special attention to the repair and maintenance aspects, keeping in view the observations of the [Kunaru] Committee and to ensure that the rolling stock is always maintained in good fettle.
141(iv)	A review of the practice of repairing wagons in traffic yards should be undertaken so as to prescribe the nature of repairs that can be properly done there and the facilities required for the purpose.	The Railways were asked to review the practice of repairing wagons in traffic yards and provide adequate facilities to carry out repairs in traffic yards. This has since been done on all the Railways.
142(i)	[See Chapter IV—Para 527]	
142(ii)	We suggest the adoption of the following measures in respect of Railway Workshops: The undesirable practice of giving periodical overhauls to wagons in sick lines, as we found at Vijayawada on the Southern Railway, should be discontinued.	The practice in question had to be resorted in sick lines as an emergency measure on a temporary basis and has since been discontinued. Wagons are not being given periodical overhaul in sick lines now.
142(iii)	Manufacture of wagons should be centralised in a separate workshop so that the repair workshops may give undivided attention to the periodical overhaul of wagons.	The progressive withdrawal of wagon manufacture work from railway workshops is being done as plan need.
42(iv)	The unsatisfactory practice of cannibalising spare parts should be eliminated.	The Railways were asked to take necessary steps to avoid such irregular practices. These instructions have since been acted upon.
42(v)	[See Chapter IV—Para 512]	
43	[See Chapter IV—Para 534]	
44 & 145	[See Chapter IV—Para 512]	
146 & 147(i) to (v)	[See Chapter IV—Para 549]	
148	We emphasise the need for improvement in the quality of supervision on the maintenance and repair of rolling stock and adequate follow-up action to remove defects.	The Railways were asked to take suitable steps to review the prevailing position and effect improvement in the quality of supervision and inspection practices, wherever necessary, in their workshops, running sheds, sick lines etc. in order to ensure of high standard of maintenance of rolling stock. Necessary action has been taken by the Railways.

APPENDIX—*contd.*

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CHAPTER VIII—RESEARCH		
149	We note the extreme inadequacy of the Railway Research and Testing Centre in regard to its equipment and personnel and also the limited range of its work and achievement against the vast background of the requirements of a large organisation like the Railways.	The Organisation of the Research, Designs & Standards Organisation has been expanding and developing both in equipment and in personnel. The importance of the expansion of Research, Designs & Standards Organisation consistent with the needs of research and developmental work on the Railways is kept in view and the necessary facilities are afforded to the organisation.
150	[See Chapter V—Para 585]	
151	[See Chapter V—Para 583]	
152	[See Chapter V—Para 588]	
153 & 154	[See Chapter V—Para 590]	
155(i)	[See Chapter IV—Para 387 & Chapter I—Para 593]	
155(ii)	[See Chapter IV—Para 396 and Chapter V—Para 593]	
55(iii)	[See Chapter V—Para 593]	
155(iv)	[See Chapter IV—Para 368 and Chapter V—Para 593]	
155(v)	[See Chapter IV—Para 515 and Chapter V—Para 593]	
155(vi)	[See Chapter V—Para 593]	
155(vii)	[See Chapter IV—Para 457 and Chapter V—Para 593]	
155(viii)	See Chapter V—Para 593	
155(ix)	In order to develop equipment for expediting the welding of the track, which would be a safeguard against sabotage on vulnerable sections of the Railways, investigation of the flux used in thermit welding should have been undertaken.	Development of the flux used in aluminothermit welding has already been undertaken. Research, Designs, and Standards Organisation have successfully developed 'portions' in conformity with the relevant railway specifications. Such portions are also available from the private sector.
156(i) & (ii)	[See Chapter V—Para 595]	
156(iii)	Research items should be taken to successful conclusions and not left incomplete over a large number of years.	As far as practicable this recommendation of the [Kunzru] Committee is being followed. [See also Chapter V Para 595]
156(iv)	All research items, including those which are partly undertaken by the Railway administrations, should be strictly under the control of this Organisation.	All important items of the research are coordinated by the R.D.S.O. [See also Chapter V Para 595].
156(v)	[See Chapter V—Para 595]	
157	[See Chapter V—Para 597]	
157(f) to (iii)	[See Chapter V—Para 599]	
158	[See Chapter V—Para 601]	
159	[See Chapter V—Para 601]	

APPENDIX—contd.

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60,161 & 162	[See Chapter V—Para 606]	
163	We suggest the recruitment of eminent scientists and engineers for which contacts should be maintained with Universities, technical institutions and research centres and any procedural hurdles in the selection and appointment of suitable persons should be removed. In order to attract and retain such persons, the terms of their employment and their prospects should be made sufficiently attractive.	The R.D.S.O. is engaged on applied research and design development connected with different fields of railway engineering. Most of the staff in this Organisation has, therefore, to consist of engineering personnel with requisite practical railway experience. The problems of basic research are framed out to the National Laboratories and Engineering Universities. Scientists will be inducted into the Organisation as the need develops.
164	We suggest for consideration the question of converting a certain percentage of posts of Senior Design Assistants into Class II posts, or placing them in a special class which, in due course, may take them to class II and, in exceptional cases, even to class I service.	In pursuance of the decision to induct scientists in R.D.S.O., two posts—a Director and a Deputy Director in Metallurgical and Chemical Directorate—were created. The post of Deputy Director will be filled by direct recruitment through UPSC. A candidate has been recommended by the Commission who will be offered appointment shortly. The post of Director has, however, been filled by promotion of the Joint Director (M & C).
165	We indicate the broad contents and duration of training to be given to technical officers and staff, both in India and abroad, and suggest that tests should be held to see that trainees have properly utilised their opportunities.	With the expansion of the R.D.S.O. during the last few years, the avenues of promotion of the Class III technical staff to Class II have increased due to creation of additional class II posts. In addition to this, a decision was taken that 20 per cent of Class I posts in Senior scale in the rank of Assistant Director should be reserved for Class II technical officers belonging to the R.D.S.O. promoted from Class III to Class II.
166	We suggest that post-graduate courses in Railway engineering be provided at one or two Universities and technical institutes where students may be awarded scholarships and fellowships for the investigation of some of the Railway problems of a fundamental nature.	The broad outlines of the training programme suggested by the [Kunzru] Committee are generally being followed. A detailed programme of training of officers and staff of the R.D.S.O. and from the Railways will continue to be worked out and implemented from year to year according to the requirements.
167	[See Chapter V—Para 610]	In order to get maximum benefit from the foreign training of railway officers and Staff, a detailed procedure was laid down, according to which each trainee on his return from abroad should submit three copies of his report on his training. These reports are carefully studied by the respective Directorates to assess the benefits derived by the trainee and to see what practical use could be made of the same.
		Director General, R.D.S.O. was asked to process the matter with the engineering Universities/Institutes and ascertain from the Institutions whether a few of the research scholars could be associated with the investigation of problems of fundamental nature connected with electric traction etc.

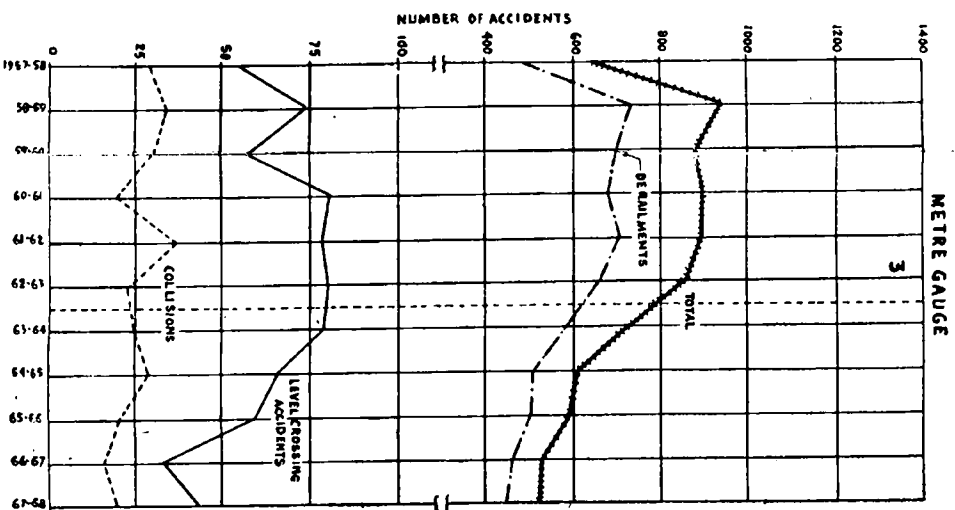
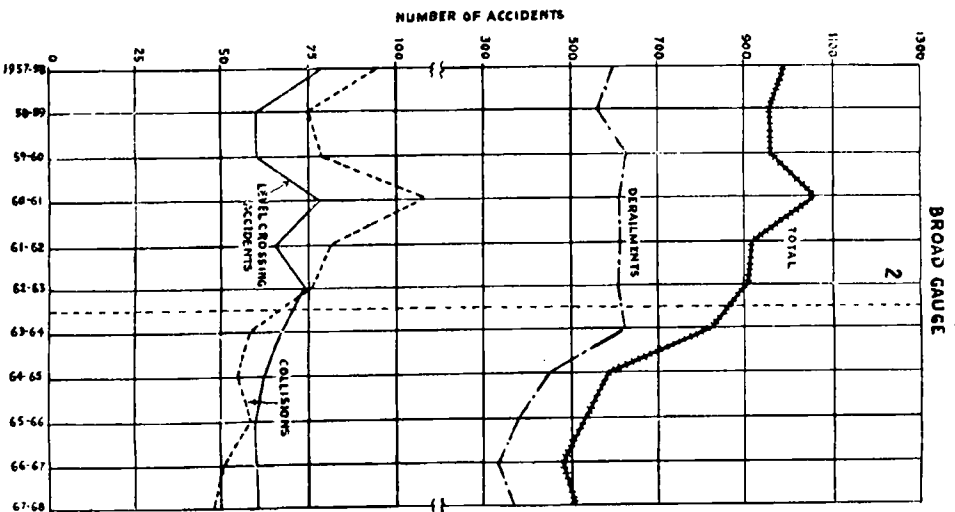
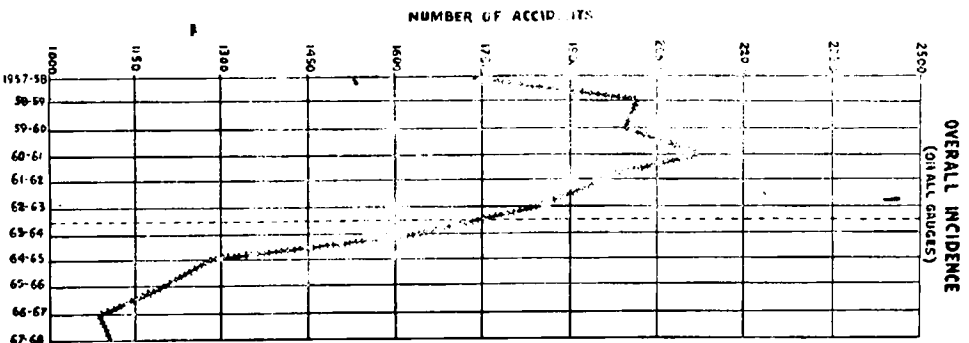
APPENDIX—concl'd.

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168	[See Chapter V—Para 612]	
169	[See Chapter V—Para 615]	
170	[See Chapter V—Para 616]	
171	[See Chapter V—Para 601]	
172	[See Chapter V—Para 618]	
173	We suggest that a review covering a period of three years should be submitted to the Central Board of Railway Research who should forward it, with their comments, for being placed before both Houses of Parliament.	The first triennial review for the period from March, 1965 to April, 1968 has been prepared, passed by the Central Board of Railway Research and is expected to be circulated to Members of Parliament in the ensuing Session.
174	[See Chapter V—Para 619]	
175 & 176	[See Chapter V—Para 621]	
177	We note the creditable performance of the Research, Designs and Standards Organisation and feel that the shortcomings pointed out by us are chiefly due to the limited facilities at its disposal. We recommend that those who show an exceptional flair and aptitude for this work, should receive every encouragement and recognition from the Government.	This has been noted. Officers of exceptional merit are given incentives like Railway Week awards.

CHAPTER IX—SAFETY ORGANISATION ON THE RAILWAYS

178 to 224 [To be dealt with in Part II of the Report.]

INCIDENCE OF SELECTED CATEGORIES OF TRAIN ACCIDENTS ON INDIAN GOVERNMENT RAILWAYS (1957-58 TO 1967-68)



NOTE: - OVERALL INCIDENCE IN GRAPH 1 IS TOTAL IN GRAPHS 2 & 3 INCLUDING INCIDENCE OF COLLISIONS, DERAILMENTS, LEVEL CROSSING ACCIDENTS & FIRES IN TRAINS

INCIDENCE OF SELECTED CATEGORIES OF TRAIN ACCIDENTS

(B.G. & M.G.)

CORRELATED TO DENSITY OF TRAFFIC

1957-58 TO 1967-68

